

#### 4.0 SUMMARY OF MAJOR DCISC REVIEW TOPICS

This section of the Diablo Canyon Independent Safety Committee report summarizes, by major topic, past and current period review and fact finding activities performed by the DCISC. More detailed reviews (i.e., DCISC fact finding meetings and public meetings) of the topics are contained in Volume II as referenced below.

## 4.1 Plant Aging Management

### 4.1.1 Overview and Previous Activities

Aging-related degradation is the gradual degradation in the physical characteristics of a system, structure, or component (SSC) which occurs over time and use, and which could impair the ability to perform its design functions. The purpose of the Aging Management Program (AMP) is to ensure that the plant continues to operate safely and within its design and licensing bases throughout its life through the process of involving engineering, operations, and maintenance in activities to control age-related degradations or failures of SSCs to within acceptable limits.

The PG&E AMP includes a number of existing programs such as the steam generator strategic plan, reactor pressure vessel embrittlement program, erosion/corrosion program, intake structure concrete inspection activities, electrical cable aging, buried commodities, and concrete/steel structures, to name a few. The scope of the systems, structures and components to be covered by the program continues to evolve and expand.

In 1998 the Aging Management Program was transferred from San Francisco to the station Steam Generator Engineering Group. More reliance was being placed on support from EPRI, DOE Guidelines, and Westinghouse Owners' Group (WOG) Life Cycle Management (LCM) and License Renewal (LR) programs.

As a part of Aging Management, the plant has developed System Long Term Plans (SLTP) which specify needs and actions for systems for the next five years. The DCISC Team reviews and reports on the SLTPs when it reviews a system with the System Engineer at most fact-finding meetings.

In the last reporting period, the DCISC concluded that (1) the overall DCPM Aging Management Program management appears to have lost its momentum and become relatively inactive since 1998 and (2) there was no apparent improvement in some implementation problems. The DCISC was concerned that this period of inactivity would lead to future problems and recommended that PG&E take steps to augment the program.

#### 4.1.2 Current Period Activities

During the current reporting period, there was one fact finding meeting held to obtain an update on the DCPD Aging Management Program (Volume II, Exhibit D.2, Section 3.15) and another to review a new aging management initiative, the Generation Vulnerability Investigation Team (Volume II, Exhibit D.7, Section 3.9). The results of these reviews are summarized below.

##### **Aging Management Program**

PG&E had completed a comprehensive review and revision to the Aging Management Program procedure (see below) which described management's vision and included the role of the System Long Term Plans (LTPs) and interactions with the Maintenance Rule as major components of AMP. (See Section 4.5 for a review of System Long-Term Plans.) **These actions appeared satisfactory to the DCISC during the current reporting period.**

PG&E also committed to identify an individual to take over the position of Aging Management Program Director and who could commit the amount of time necessary to ensure proper ownership and direction.

Nuclear Quality Services performed an Aging Management Program assessment, which resulted in the following findings of failures to follow the aging management procedures:

- The Plant Aging Management Working Group has not been meeting.
- The Aging Management Program Manager was not a full-time position.
- No aging management "training and awareness" had been conducted for system engineers, support engineers, maintenance foremen, mechanics, and operations.
- Management's expectations for the Aging Management Program were not clear.

A corrective action completion date of July 22, 2000 was initially established; however, this was revised to September 12, 2000. The controlling AMP procedure was revised in August 2000 to accomplish the following:

- Updated organizational structure and titles consistent with the present organization.

- Changed responsibility for Aging Management from Regulatory and Design Services to Engineering Services.
- Changed full-time Aging Management Program Manager to part-time Aging Management Program Coordinator (AMPC).
- Eliminated the Plant Aging Management Working Group (the AMPC will call in resources as needed).
- Revised the requirement from an annual to a periodic assessment report.

In addition to the above procedure changes, the following management expectations and actions were identified:

- Continue to rely on and develop the System Long-Term Plan process. The assigned System Engineer has the responsibility for taking the lead in each area.
- Consider undertaking an effort to identify "gaps" in the maintenance program for age-related failures (e.g., equipment failures, such as expansion joint, bus bar, and control board lamp socket failures) of components not previously included in the Aging Management Program. (This is similar to DCISC Recommendation R00-6 from the previous DCISC reporting period (see Volume II, Exhibit H)).
- Involve the Asset Teams to provide feedback on equipment condition. (Asset Teams are already included in the System Long Term Plan Process).
- Investigate what other STARS partners are doing to address aging management.

The newly named Aging Management Program Manager was to prepare a document identifying possible future directions for aging management. PG&E anticipated employing a consultant to perform a gap analysis in order to have a comprehensive, systematic approach. The document would be reviewed by the Manager of Engineering Services and then presented to management for concurrence. Additionally, PG&E plans to complete all system long term plans in 2001. Following Outage 1R10, DCPD planned to implement an Integrated Problem Resolution Team.

NQS closed all above items except the future directions document and will track it with the AR.

PG&E satisfactorily addressed the NQS aging management assessment findings. Management appears to be making progress in identifying the future direction of aging management, although progress has been slower than expected.



The DCISC plans to review aging management directions and management expectations in the gap analysis study after it is approved and follow up on the effectiveness of the Integrated Problem Resolution Team.

#### **Generation Vulnerability Identification Team**

DCPP has had seven or eight aging-related failures of equipment in the last year that impacted planned outages, generation or forced outages. All were caused by balance of plant equipment. The DCISC had reviewed these failures and reported on them in the last annual report, and, although not directly related to plant safety, some of the failures did produce transients and challenge safety systems. An Integrated Problem Response Team (IPRT) approach was sanctioned by the DCPP Management Team to address the lost generation. DCPP established the Generation Vulnerability Identification Team (GVIT) in late 2000 consisting of 12 members and sponsored by the Director of Engineering and Maintenance. The original scope of the work was:

- Focus on identifying potential generation losses from equipment failures that can exceed one full day of generation, or a greater than 10% derate for more than one day.
- Enhance/create a process for longer-term reliability or aging management issues that merit funding.
- Provide recommendations and solutions to management on resources, tools, and process changes.

This is phase one. PG&E will make a decision about aging management after completion of recommendations based on phase one. The majority of the work has been completed, and the final report will be out by June 30, 2001. The DCISC plans to review the report in the next reporting period.

It appears that DCPP is taking a positive approach in addressing their problems on loss of generation from aging equipment. The DCISC will review the final Generation Vulnerability Identification Team (GVIT) report after it is issued.

#### **Passive Device Aging Management Investigation**

The DCISC learned about a new initiative, Passive Device Aging Management Investigation, which was begun in late 2000.

Completion was expected in June 2001. The DCISC plans to review the program results in the next reporting period.

#### 4.1.3 Conclusions

PG&E appears to be taking positive steps in reviving neglected portions of its Aging Management Program with new leadership, augmented management support, and several new initiatives (the latter due in large part to aging-related failures of plant components). The DCISC has had concerns about the program in the last several reporting periods and is pleased to see progress towards improvement. A major element of DCPD aging management is the system long-term planning process in which system engineers are responsible for monitoring, measuring and planning for aging-related effects.

The DCISC will continue to follow PG&E's progress with aging management, including review of the Generation Vulnerability Identification Team report and the Passive Device Aging Management Investigation Team report.

## 4.2 Conduct of Maintenance

### 4.2.1 Overview and Previous Activities

The DCPM maintenance program has been substantially improved since the startup of the DCPM. The initially high and increasing Operating Capacity Factor, from 86% in 1985 to 93.3% for Unit 1 and 96.2% for unit 2 in 2000, demonstrates that the DCPM maintenance program has been effective. The DCISC has reviewed the DCPM maintenance program, or key elements of it, at public meetings and fact-finding Meetings.

The NRC Maintenance Rule (10 CFR 50.65) issued in 1991, required that commercial nuclear plant licensees monitor the performance or condition, or provide effective preventative maintenance of all risk significant structures, systems and components (SSCs) against licensee established goals. PG&E implemented the Maintenance Rule requirements on all SSCs, as a basis for its Maintenance Program.

PG&E's drive for shorter refueling outages requires that some of the preventative and corrective maintenance that had been done during refueling outages be performed while at power in Mode 1. Because on-line maintenance, as opposed to outage maintenance, potentially places the plant at greater risk, the DCISC has investigated how risk considerations are entered into the decisions to do on-line maintenance.

PG&E had reorganized the Maintenance Department into Asset Teams. The Asset Teams were established as a result of the Work Control team to improve the process of maintaining and modifying DCPM to reduce costs while maintaining or improving quality. The five Teams have been reorganized into four teams, which are now: 1) Turbine Building Team, 2) NSSS Team, 3) Control Room/Electrical Team, and 4) Maintenance Support Team.

**The DCISC concluded in previous periods that the Maintenance Program appeared satisfactory.**

### 4.2.2 Current Period Activities

During the current period, the DCISC reviewed conduct of maintenance activities at three fact-finding meetings (Volume II, Exhibit D.2, D.5 & D.6) and one Public Meeting (Volume II, Exhibit B.9). These activities were as follows:

- Discussion with Maintenance Manager
- Asset Team Review
- On-Line Maintenance

### **Meeting with Manager of Maintenance Services**

The newest DCISC Member and a consultant met with the Manager of Maintenance Services (Volume II, Exhibit D.2) for an informational briefing. The Manager reported on the Strategic Teaming and Resource Sharing (STARS) activities that affected Maintenance. He described the change from functional maintenance teams (e.g., electrical, mechanical) to multi-disciplinary Asset Teams, which has worked out well for the plant. In the area of human performance, the Manager stresses proper tailboards, communication and self-verification. Maintenance supervisors did not believe craft training was time well-spent; however, the craft believed otherwise. Maintenance Services is now performing a self-assessment of its training programs.

### **Asset Team Update**

The Asset Team Leader (ATL) for the Turbine Team presented the overall update for all the Asset Teams (Volume II, Exhibit D.5). The Asset Teams complete about 190 Action Requests per month and if they can keep rework to under 10 per month, that has been considered acceptable by PG&E. In the Human Performance area, there has been a big push in midsummer for supervisors to talk to workers, for tailboards and for reverse (feedback) tailboards about human performance issues.

DCPP recently had four events involving work on the wrong piece of equipment or wrong unit. PG&E believes that part of the cause for these events is stress on the workers from PG&E workers moving in from other plants and alignment with other utilities. DCPP management talks to employees explaining that keeping focused on doing work safely is more important than worrying about outside events.

The Asset Team Leader discussed Industrial Safety and the 1R10 outage schedule. In 1R10 PG&E many meetings with employees emphasizing that safety was the focus and that, even though they had a short outage schedule, safety came first. PG&E made a big push on ALARA in 1R10 but did not meet the goal; however, they performed better than for any other Unit 1 outage.

The corrective maintenance (CM) backlog and schedule adherence for the year were reviewed. The present CM backlog is 556 with a goal of 425. Operations and Maintenance are doing well in prioritizing the jobs that need to be worked on schedule.

The issues facing the ATLs were described. DCPD needs to make the ATLs' jobs easier as DCPD has added more work to the ATL, which is one of the hardest jobs on site. The ATLs are not able to do everything that they are expected to do. The NSSS Team is changing the way they use the ATL. They have one ATL direct the work one week while the other ATL is planning work for the next week when he will be directing the jobs. The Team Leader feels that the Asset Teams have been successful. Work is getting done more effectively and workers are sharing work better. This is building a lot of ownership into the work force, though it can still be improved.

The ATLs were given tests in all disciplines to determine if they needed cross discipline training and system training. Resultant training was completed in January 2001.

It appears that the Maintenance Asset Teams have been making progress in improving overall performance of the group. They have made improvements in industrial safety and ALARA in 1R10. They have also determined the training necessary for the Asset Team Leaders in each of the disciplines, and the resultant training has been completed.

#### **On-Line Maintenance**

The DCISC met with the Outage Director and Supervisor of the Probabilistic Risk Assessment (PRA) Group to discuss the status of DCPD on-line maintenance (OLM) (Volume II, Exhibit D.6). The last DCISC review in December 1999 concluded that DCPD was using OLM more often to reduce outage scope and was developing and updating its risk assessment tools to appropriately control the resultant risk of removing components from service during operation.

It was reported that NRC Regulations had become mandatory in November 2000 in that the risk assessment requirement "shoulds" were changed to "shall". Also, NRC Regulatory Guide 1.182 which embraces NUMARC 93-01 "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants", is more closely focused on managing the calculated risk associated with maintenance. DCPD had revised its maintenance program to implement the new requirements.

A self-assessment was performed in September 2000 to determine the readiness of DCPD to implement the new requirements. The team consisted of several DCPD personnel and a Maintenance Rule representative from Callaway Nuclear Plant, a STARS member. The results showed that many of the necessary elements were in place in the existing PRA and On-Line Maintenance Programs, but four recommendations were made, and DCPD made these changes prior to the November 28, 2000 implementation date.

These changes require the Operations Work Week Managers to ensure that risk management actions are completed for planned work. This includes expected plant conditions and expected external conditions due to seasonal effects. The Control Room Shift Foremen are required to evaluate and manage risk of all activities or conditions based on the current plant state prior to implementation of maintenance activities. The procedure also requires an assessment of the plant trip risk with a checklist for both pre-planned and emergent activities.

Formal classroom training has been provided to Maintenance and Operations personnel on the new requirements. Additionally, just-in-time (JIT) tailboards are provided prior to performance of maintenance activities.

Additionally, with the move to Standard Technical Specifications, the On-Line Maintenance Program (OLM) (used to assess risk), can take advantage of the 7-day component-outage-window rather than the previous 72-hour window.

An NRC inspection was performed in February 2001 of various plant activities, including maintenance risk assessment. The NRC inspectors concluded that DCPD had exhibited good use of the Maintenance Rule. They noted that DCPD had provided good, effective compensatory measures during a California Grid Stage 3 alert conditions (i.e., possible increased electrical grid instability). DCPD had developed a special risk management guidance statement identifying additional reactor trip risk classifications for two risk-significant systems, the 500 kV electrical system and the 230 kV start-up power system, during Grid Stage 3 alerts in which there could be increased grid instability.

The California electricity supply shortage and increasing grid alerts have caused DCPD to defer some equipment maintenance during these periods to reduce the risk of plant trips. DCPD

practice was to move the equipment to a later maintenance window when they did not believe reliability would be affected; however, possible effects could be larger scope outages and a shift in focus from summer to winter. DCPD noted that the capital budget had been lowered due to PG&E's debt problems and that revised plans for spending were under development. The DCISC will follow up this item due to concerns of long-term safety and reliability, if spending is significantly lowered or delayed.

The DCISC received an update of the on-line maintenance program at the June 2001 Public Meeting (Volume II, Exhibit B.9). PG&E reviewed the schedule performance adherence trends from July 2000 through present. Their goal is 90% to meeting the schedule. It appears that they are meeting their goal except for times when they have forced outages or curtailments and need to reschedule the work. DCPD implemented the NRC Maintenance Rule A (4) in November 2000. They revised on-line maintenance risk management process to include plant trip hazards and external risks (weather, fire, etc.). The Senior Reactor Operators (Work Week Managers) and schedulers manage risk via daily work coordination process.

The cycle risk profile for units 1 & 2 listing monthly average Core Damage Frequency (CDF) contribution from maintenance was also reviewed. Noteworthy on-line maintenance examples discussed were: Unit 2 diesel expanded pre-outage maintenance significantly reduced 2R10 diesel outage work scope; ASW FCV-601 motor/actuator change-out; main annunciator upgrade units 1 & 2; and Unit 2 radiographic check valve inspection saved 800 person Rem in predicted 2R10 exposure.

Some of the major challenges that have occurred were discussed. Unit 1 on-line stator coil chemical cleaning was performed in February, 2001. DCPD initially curtailed capacity due to high generator stator temperatures. The chemical cleaning restored full capacity and avoided a forced outage. As a result of Stage 3 grid emergencies in California, comprehensive plant trip risk management policies were developed. A listing of the work scope impacts due to System electrical demands was also reviewed.

Upcoming efforts for DCPD are new 10CFR50.59 implementation in July 2001 and ORAM-Sentinel maintenance risk evaluation tool development by November, 2001, which the DCISC will review.

**It appears that DCPD is managing on-line maintenance well,**

using risk assessment as tool and has benefited from the results. DCISC will continue to follow DCPD use of on-line maintenance.

#### 4.2.3 Conclusions

The DCPD Maintenance Program appears to be functioning satisfactorily and implemented properly to meet NRC Maintenance Rule requirements. The Maintenance organization is functionally aligned to the work scope, and the On-Line Maintenance Program is soundly PRA-based. The DCISC will follow up on the possible effects on safety of lowered/delayed plant capital spending.



#### 4.3 Conduct Of Operations

##### 4.3.1 Overview and Previous Activities

The following are operations-related items the DCISC has reviewed in previous reporting periods:

- Severe Accident Management Guidelines (SAMG) - SAMG provide guidance on how to manage a severe low probability occurrence to minimize the risk to the plant and public. All DCPG specific SAMG are complete. Training of the identified people for SAMG has been completed.
- Safety Parameter Display System (SPDS) - the SPDS was developed in response to the TMI-2 incident as part of the change over from "event based" to "symptom based" emergency operating procedures. The objective of the SPDS is to allow monitoring of the status of critical plant characteristics for use primarily by the Shift Technical Advisor (STA) during accident scenarios.
- Operations Tailboards - PG&E has placed increased emphasis on improving Operations tailboards, and a process of observing tailboards has been implemented.
- Clearance Process - DCISC continued to review of the improvements that PG&E has in the clearance process which has resulted in significantly improved performance.
- Jumper Program - The Jumper Program includes temporary changes made to the plant, such as electrical jumpers, lifted electrical leads, mechanical jumpers/bypasses, bypasses of safety functions, and installation of measuring and test equipment (MT&E). The goals of the program are to maintain plant configuration control, keep Operations and the System Engineer up-to-date, and minimize the number of jumpers. PG&E appeared to have an effective, tightly controlled process for controlling temporary electrical and mechanical jumpers.

In previous reporting periods the DCISC has found that the conduct of Operations appeared satisfactory.

#### 4.3.2 Current Period Activities

The following operations-related items were reviewed by the DCISC during the current reporting period:

##### **Meeting with Manager of Operations Services**

The DCISC met with the Manager of Operations Services at the October, 2000 Fact-Finding Meeting (Volume II, Exhibit D.2). The following topics were discussed:

- Outage 1R10 - the outage was going well with low dose rates and "pretty good" human performance.
- Operations culture changes - improvements were needed in initial operator training, communications with management was more frequent, and they were working on better explaining the merit rating and pay system to operators.
- Staffing - a new operator class was being formed.
- Training - supervisory/management training was being developed for Operations.
- Human Performance - this indicator seems to be leveling off even though managers believe there is still room for improvement, so more emphasis may be needed.

##### **Observe Control Room Shift Manager Turnover**

The DCISC observed at the October Fact-Finding Meeting (Volume II, Exhibit D.2) the afternoon turnover between the departing day shift manager and the oncoming night shift manager. The two managers used the Shift Manager Turnover Report, which included all major conditions and activities for both units. It was noted that the first winter storm of the year was approaching with moderate ocean swells and kelp. The managers also used a Technical Specification Summary Sheet which listed component or train non-availability, compensatory actions and alternate line-ups. The Shift Foremen were separately performing the turnover and control board walkdown.

A Shift Brief was also observed for the departing and on-coming shifts for the Unit 1 outage. The on-coming Shift Manager coordinated the brief. A similar shift brief was to be performed later for the operating Unit 2.

**The Outage 1R10 Operations shift turnovers and briefs appeared satisfactory.**

## **Control Room Tour**

The DCISC met with the Manager of Operations Services at the March, 2001 Fact-Finding Meeting for a tour of the recently re-configured Control Room. DCPD had implemented a new Control Room formality policy and had re-arranged the Control Room complex to provide fewer distractions to the operators. Access to the room was restricted solely to Control Room operators with permission required for anyone else to enter. All non-control-room-operator personnel (e.g., clerks and Shift Technical Advisor) were moved outside to adjoining offices. A new, adjacent briefing room was provided such that briefings would not interfere with on going operator duties. A safety priority sign provided a reminder that safety comes first, before generation, cost or schedule.

**The updated Control Room and access policy appeared to provide a quieter, less distracting atmosphere for the control operators than before.**

## **Establishment of Priorities for Operators**

The DCPD Operations Manager and Day Shift Supervisor discussed with the DCISC Team the establishment of priorities for the operators. Operations management has been meeting with the operating crews since August 2000 to present these priorities.

Nuclear and personnel safety is the most important priority for the plant, and this is being stressed to all employees in Operations. The Operations Manager has visited other plant control rooms to observe professionalism of the operations crews. The Shift Manager has also taken some of the operating crew to other plants to observe operations. Operations management is working with the operating crews to improve professionalism in the control room including improvement the dress of the employees. The Operations Section Policy on "Expectations for Nuclear Operator Watchstanders" was also discussed. All Shift Managers have agreed to sign off on this policy.

The scheduling of work was reviewed. The Asset Teams and Operations have been working together to prioritize the work. Maintenance has been meeting schedule about 90% of the time. The rolling 12-week schedule for Surveillance Test Procedures has also been working well.

Operations tries to make schedule within reasonable cost.

Shift Manager and Shift Supervisors make the decision whether work can be deferred. As an example, the last storm season led to bringing both units down to 20% power. The decision to bring the units down was based on what was best for plant safety, not what State power load was, energy needs, cost or anything else.

DCPP stated that the PG&E bankruptcy has not had any impact on employees. They continue to communicate all information to the employees on PG&E financial status. They also feel that morale in Operations and the leadership team has improved in the last year.

**By making nuclear safety the highest priority, it appears that DCPP continues to stress the proper priorities to the operating crews and is working on improving professionalism in the control room.**

#### **Improved Technical Specifications**

PG&E reported at the September 2000 Public Meeting (Volume II, Exhibit B.3) that the program to transition DCPP to the Improved Technical Specification (ITS) had recently been completed. DCISC had reviewed the DCPP ITS at previous fact-finding and public meetings. The ITS were developed beginning in 1995, with DCPP working in conjunction with the Wolf Creek, Callaway and Comanche Peak nuclear plants which partnered with DCPP in that effort. The Licensee Amendment Request (LAR) was submitted to the NRC in June 1997, and all Plants received and responded to requests for additional information. The NRC issued the License Amendment (LA) in May, 1999.

The new set of Technical Specifications (TS) themselves is somewhat less lengthy than before; however, the basis for the TS has expanded considerably. The implementation of the TS was originally scheduled for the end of May 2000. However, that date was changed and an emergency LAR submitted to the NRC to permit postponement of implementation of the ITS until the end of June, 2000 due to PG&E's concern over implementing the ITS during the restart of both Units because of the 12 kV bus outage which had occurred.

An ITS Implementation Project Manager was created, and a Team was formed to identify all required changes resulting from the ITS. DCPP submitted a clean-up LAR to the NRC during March, 2000 which addressed the changes resulting from the

Implementation Program (IP) for the ITS. A Management Oversight Team was formed to monitor progress of the IP. A self-assessment was performed utilizing personnel from DCP's Licensing and Quality Assurance organizations as well as personnel from the partnering utilities. This self-assessment identified enhancements to the implementation efforts but no major issues were found which would hamper the process.

PG&E reviewed the comprehensive efforts made to adequately train the licensed operators and other necessary DCP's personnel to the ITS. These efforts included a detailed review of TS rules of usage and all the changes made to the TS.

There had been no errors reported or identified from application of the ITS. There have been some instances where a TS, or a portion of a TS, has been relocated to the FSAR or to the Equipment Control Guidelines (ECG) to address a specific licensing commitment, a surveillance requirement or to better define operability criteria for a system. The ECG is a form of administrative TS which may be altered without prior NRC approval under the provisions of 10CFR50.59.

It appears that PG&E has been successful in preparing and implementing the Improved Technical Specifications (ITS). They were also successful with their training of operators and other necessary DCP's personnel on the ITS.

#### 4.3.3 Conclusions

DCP's Conduct of Operations appeared satisfactory, including outage activities; Control Room policies and demeanor, and priorities; and preparation and implementation of the Improved Technical Specifications.

#### 4.4 Emergency Preparedness

##### 4.4.1 Overview and Previous Activities

An Emergency Preparedness Program has been in-place since the beginning of the nuclear power industry; however, the accident at Three Mile Island brought substantial changes. Prior to Three Mile Island, Emergency Operating Procedures (EOPs) were primarily event-based, requiring the operator to know which event was taking place. Afterward, the EOPs became symptom-based, making it easier for the operator to decide what actions to take. The three major facilities used in an emergency drill include (1) the simulator which is used where operators responded to the accident, (2) the Technical Support Center (TSC) where the Recovery Manager, engineering, computer, radiological assessment, NRC, and operations, as well as documents and procedures, are located and (3) the offsite Emergency Operations Facility (EOF). An Operations Support Center (OSC) provides a location to stage and dispatch operations, maintenance, firefighting and radiation protection personnel.

The DCISC reviews Emergency Preparedness at DCPD on a regular basis. Past reviews have included the following:

- Review of a full emergency exercise in October 1990
- Tour of Off-Site Emergency Operations Center in August 1994
- A tour of the Technical Support Center (TSC) in April 1995
- Observation of the November 28-29, 1995 annual emergency exercise.
- Review of the status of the emergency offsite communication capability at DCPD.
- Observation of the July 30, 1999 Emergency Drill
- Observation of the November 4, 1998 annual graded emergency exercise
- Observation of the December 3, 1999 Emergency Drill designed to test the UDAC dose assessment and projection function
- Observation of the annual graded emergency exercise on May 10, 2000. The exercise included participation by DCPD, San Luis Obispo County, State of California, NRC and FEMA personnel as players. The NRC and FEMA observed and graded the exercise.
- Resolution of problems with the Unified Dose Assessment Center (UDAC), the joint DCPD/County radiation dose calculation and assessment function.

The DCISC had concluded that DCPD has performed well in its emergency drills and exercises, making improvements as needed, especially in radiation release dose calculation and reporting activities.

#### 4.4.2 Current Period Activities

The DCISC reviewed the following Emergency preparedness items during the current period:

##### **Alternate Source Terms**

The DCISC reviewed DCPD's potential use of alternate source terms (Volume II, Exhibit D.5, Section 3.3). A "source term" is the assumed timing, magnitude, and chemical form that radiation releases take, and it is used to calculate radiation releases from nuclear accidents. The original source term was contained in NRC Technical Information Document (TID) 14844. The results of design basis accident analyses using this TID are conservative. The Alternate Source Term (AST) is an NRC-accepted alternative to TID 14844, based on significant improvements in understanding the generation and behavior of fission product releases from severe nuclear power plant accidents since the publication of TID-14844. The AST is insufficient by itself as a basis for nuclear emergency preparedness requirements; however, the potential benefits in implementing the AST are:

- Increase in allowable containment leak rates
- Simplify the control room filtration system by changing the number and/or types of filters
- Increase in allowable valve stroke times for containment isolation valves
- Increase post-LOCA recirculation leakage
- Relax equipment qualification requirements by reducing EQ concerns for the equipment required to be operable in the short-term
- Relax containment isolation requirements
- Eliminate or limit containment spray additives, or improve operating margin for containment pressure.
- Update plant accident atmospheric dispersion factors(x/Q) using current meteorological data.

Currently, DCPD has sufficient margin in all of the design basis accidents except Steam Generator Tube Rupture, which is being reanalyzed by Westinghouse using TID 14844. PG&E believes there are no immediate needs for reanalysis using AST at this time but will continue to monitor other utilities' progress in their implementations of the AST.

#### **Observe Multi-Facility Table Top Emergency Exercise**

The DCISC observed two "table top" emergency drills of two emergency organizations on Friday March 16, 2001 (Volume II, Exhibit D.6, Section 3.4). The Technical Support Center (TSC) and the Emergency Offsite Facility (EOF) [and associated Unified Dose Assessment Center (UDAC)] were exercised independently with participants playing their roles around tables in their respective facilities without outside participation, hence the term "table top". Each organization participated in two separate predetermined scenarios. Each scenario included objectives for evaluation.

The initial events for Scenario #1 at the TSC were typical for a drill, i.e., loss of essential equipment, in this case, Auxiliary Salt Water (ASW) Pumps (during a winter ocean storm) and additional equipment such as Auxiliary Feedwater Pumps. The scenario proceeded through all emergency action levels (EALs) to a General Emergency (GE).

The TSC facility had been rearranged since the last DCISC visit and exhibited improved utilization of space, thus benefiting communications. The TSC was staffed in a timely manner and proceeded to establish communications and plant status information flow. Support teams represented were engineering, radiological assessment, and government liaisons. Status and prioritized action boards were maintained. Regular status reports were made. Emergency Action Levels (EALs) were decided and announced in an accurate and timely manner. The demeanor in the TSC appeared to be organized and professional. There was good use of three-way communication.

The critique received good participation, and it appeared to be on target. There were no major problems, and areas for improvement included improved information flow and shorter tailboards. The participants and monitors agreed that all objectives were met.

Scenario #2 was observed at the Emergency Offsite Facility (EOF). The EOF was partially staffed with representatives from



engineering, radiological assessment/monitoring, ERO management, and government liaisons. This scenario was initiated by an earthquake resulting in loss of all offsite power and a small steam leak from a steam generator in containment. An emergency diesel generator failed to start, and auxiliary feedwater pumps tripped, resulting in loss of the ability to maintain hot shutdown conditions. The players recognized the conditions and proceeded to General Emergency. Protective actions and notifications appeared accurate and timely. Radiological monitoring teams were controlled appropriately and provided good input. Three-way communication was apparent. Radiological assessment by UDAC appeared to provide timely and accurate assessments.

The EOF critique appeared productive. Emergency action levels were identified correctly, as were protective action recommendations. Status briefs were short and to the point. Engineering was effective, and government notifications were done well. UDAC performed well (in what was considered a particularly challenging scenario). All objectives were met.

#### **Emergency Preparedness Radiological Processes & Tools**

The DCISC reviewed DCPD radiation dose projection calculation methods and assessments used in emergency planning (Volume II, Exhibit D.8, Section 3.4). DCPD utilizes two computer programs to perform its dose projections: EARS (Emergency Assessment and Response System) and MIDAS (Meteorological Information and Dose Assessment System). EARS is supplied radiological data by the Radiation Monitoring System comprised of 80 radiation monitors surrounding the plant. It uses these data to calculate time-dependent release rates, which are input to MIDAS, along with meteorological data from the Meteorological Data Acquisition System. MIDAS is a terrain-specific atmospheric dispersion model, which calculates resultant downwind dose rates and doses at onsite and offsite locations within a 50-mile radius of DCPD.

These programs have been adapted to the unusually complex terrain surrounding DCPD, e.g., ocean, land and mountains. The programs have been verified by dye tests and have performed well in emergency exercises. The results of the calculations in the programs are used to recommend protective action levels (PALs) to San Luis Obispo County to advise the public regarding sheltering and/or evacuation following a plant event. DCPD has been pleased with the performance of EARS and MIDAS.

## Communicating Radiological Information to the Public

The DCISC reviewed some problems PG&E has had with conveying accurate radiation release information to the public during its May 2000 unusual event and during the May 10, 2000 emergency exercise (Volume II, Exhibit D.8, Section 3.5).

The unusual event included a fire which caused the plant to shut down, utilizing its main steam safety relief valves to relieve steam pressure. The NRC had made a news statement that radioactive steam had been released, resulting in confusion about what constituted a radiological "release" above and beyond normal approved releases.

The problems in the emergency exercise occurred at the mock public/news media briefing at the Joint Media Center. The county and PG&E plant spokespersons did not provide readily understandable radiological information for the public regarding calculated/actual dose levels and their effects and information on sheltering.

DCPP was working on the definition of a radiological "release" specifically attributable to an event. NRC is also working on their definition. DCPP is selecting the appropriately skilled persons with radiological knowledge to be added in the EOF. Such a person will hear first-hand plant and radiological conditions resulting from an event and will be the DCPP spokesperson to the news media and public. Specialized speaker training will be provided. It is anticipated that the improvements will be completed by the end of 2001.

### 4.4.3 Conclusions

It appeared that DCPP has performed well in its emergency drills and exercises and has been working on improving its communication of accurate and understandable radiation release information to the public. The DCISC plans to follow this item.

## 4.5 Engineering Program

### 4.5.1 Overview and Previous Activities

The DCISC has had a number of Public Meeting presentations by PG&E and several fact-finding meetings with PG&E to investigate the following aspects of the engineering/design program:

- Design Change Process Improvement
- Proactive Engineering Program
- Engineering Reorganization and Self-Assessment
- System Engineering Responsibilities/Walkdowns
- NTS Performance Indicators
- Management of Engineering Workload and Timeliness
- Operation & Maintenance within Design Basis (Configuration Management)
- Results of the NRC A&E Inspection
- Decreasing Vendor Support
- Licensing and Design Basis Affirmation Program (LDBAP)
- Engineering Transition
- 10CFR50.59 Major Modifications

In previous annual reports, the DCISC had concluded that PG&E had a strong engineering program.

### 4.5.2 Current Period Activities

The DCISC has investigated a number of Engineering activities at three fact-finding meetings (Volume II, Exhibit D.2, D.5 & D.6) during the current reporting period.

#### **Meeting with Manager of Engineering Services**

The DCISC met with the Manager of Engineering Services to discuss the activities of the Engineering group (Volume II, Exhibit D.2). He described the engineering transition in which the engineering function moved from PG&E Headquarters in San Francisco to the plant. He also described the System Engineer Program. For Outage 1R10, Engineering had formed local leak rate testing teams with Operations, which had been effective. Engineering had hired ten recent graduate engineers who were going through a structured training and familiarization process. The average age of employees (now

about 47) was increasing steadily, and an increase in retirements was expected, prompting the need for new hires.

### **Engineering Work Load Performance Indicator**

The Manager, Engineering Services (ES) presented the ES workload and the indicators used to monitor their performance (Volume II, Exhibit D.5). They track Engineering Services Action Requests (ARs) and Action Evaluations (AEs).

Their goal for total ARs and AEs is to be down to 2000. In 2000 they trended down to less than 2000 and then up to about 2300 to 2400 and are now down to about 2000. Design Engineering spends about 80-90% of its time on ARs and AEs. Not all Engineers are doing things that can be tracked. It appears that PG&E does not have the ability to track all the work that is not covered by ARs and AEs and does not know if DCPD is doing everything that needs to be done.

DCPD measures how System Engineers are doing by how they are performing system walkdowns. In Design Engineering, they do not have enough manpower to do all the work that needs to be performed and some work has to be sent out to contractors (outsourcing). The Engineering Group did meet their deadline to get all the design packages to the outage group to support 2R10 refueling outage.

DCISC suggested that DCPD should have some method to identify the entire Engineering Workload to determine if they have enough resources to perform the work without getting behind.

It appears that DCPD has methods to track performance and workload of ARs and AEs and looks at the performance of System Engineers. However, they do not appear to have a method for tracking everything that is not covered by either ARs or AEs. They also do not have a method to identify the entire the Engineering Work Load to determine if they have enough resources to perform the work without getting behind.

The DCISC believes that DCPD should investigate a method to identify the entire Engineering Workload to assure that the necessary work is performed to effectively support safe operation of the plant.

## **Configuration Management Program**

The DCISC Team met with the Configuration Management Program (CMP) Manager for an update on Configuration Control. The purpose of Configuration Management (CM) is to assure consistency between design requirements, physical configuration and facility configuration information (i.e., as-built documents, including procedures). PG&E described the current CMP referring to the controlling directive and described recent program changes. CM is implemented through more than 200 plant procedures, which conform to the controlling directive. Changes consisted primarily of augmenting the implementing procedures to include CM guidance and a checklist and better instructions for assuring that the impact of any change is reflected in all related documents. Effectiveness of CM is measured by the CM Index.

The only adverse trend has been related to the maintenance of the Component Data Base where an Non-Conformance Report (NCR) had just been cleared with corrective actions to improve the consistency of updating the database. Self-assessments are being used to determine whether the issue has been resolved. There have been no NRC Notices of Violation of CM in the last two years. The next self-assessment of CM is planned for July - August 2001 and will include personnel from other (STARS) plants.

A Generation Vulnerability Identification Team has been initiated to identify probable future generation losses by evaluating the preventive maintenance, aging management, and decision making process against current DCPD internal and industry expert states-of-knowledge. This report is planned to be complete by June 30, 2001 and recommendations implemented by year-end.

The Configuration Management Program at DCPD appeared satisfactory with measures in place to gauge the ongoing program effectiveness, which the DCISC should review annually. The DCISC should review the results of the Generation Vulnerability Identification Team report following its release in June 2001.

## **Equipment Qualification Program**

The DCISC met with the head of the Equipment Qualification Program (EQP) to obtain the status of the program. In the last several years the only problem in the EQP had been a 1998 NCR

for a valve that had been tentatively identified as unqualified, and which had been resolved. The valve had been properly qualified, but the qualification documentation had been misinterpreted. There had been no other problems. Currently, the only major EQP group initiative was updating its records, from handwritten files into a computer database.

NQS has performed audits every two years, and one was underway at the time of the DCISC visit. A self-assessment was performed in 2000 by a contractor using a "vertical slice" approach; there were five EQ files needing category changes but no significant findings.

The documentation and updating of accident environmental conditions are controlled as design basis information and updated as necessary.

The Equipment Qualification Program appeared to be functioning well with no significant outstanding issues.

#### 4.5.3 Conclusions and Recommendations

The PG&E engineering programs, including Configuration Management and Equipment Qualification, continue to be satisfactory for supporting safe operations at DCPD.

Although DCPD has methods to track performance and work load of ARs and AEs and System Engineers, they do not appear to have a method for tracking work that is not covered by either ARs or AEs nor to identify the entire Engineering Workload to determine if they have enough resources to perform the work without getting behind.

R01-1 It is recommended that DCPD develop and implement a method to identify and monitor the entire Engineering Work Load to assure that the necessary work is performed to effectively support safe operation of the plant and to help in ensuring adequate engineering resources are available.

The DCISC will continue to monitor PG&E's engineering performance, including workload management and a review of the results of the new Generation Vulnerability Identification Team report following its release in June 2001.

#### 4.6 Event/Problem Analysis and Corrective Action

##### 4.6.1 Overview and Previous Activities

During the previous reporting year, the DCISC fact finding team reviewed numerous events at DCPD and analyses performed in support of the resolution of these events and/or to improve safety margins. The events, analyses, and programs reviewed included the following:

- The potential for containment debris to block the recirculation sump following a LOCA for which PG&E's program for assuring sump flow appeared adequate.
- DCPD Unit trips - the DCISC reviews each trip in fact-finding and public meetings.
- Emergency diesel generator (EDGs) starts - the DCISC reviews these and other engineered safety feature activations.
- Operating Experience Assessment Program - the DCISC has reviewed PG&E's program and organization for reviewing and applying industry event experience to DCPD. The program appeared satisfactory.
- Corrective Action Program - the NQS Audit/self-assessment of the Corrective Action Program (CAP) found that overall the CAP has been very effective. INPO also looked at the CAP as part of their recent INPO evaluation and were pleased with what they found. The NRC performed a CAP inspection in early 2000, which was satisfactory. The DCISC believed that PG&E should continue to look at ways to determine if the corrective action taken was effective at solving the problem.
- Recent Ocean Storm Response Experience and Strategy - the DCISC reviewed and found satisfactory PG&E's plans and responses to ocean storm surges.
- ECCS Voiding - gas accumulation or voiding is an industry concern due to the potential to render ECCS pumps inoperable during certain design basis accidents. Although PG&E did not investigate and solve the voiding concerns in a timely manner, it now appears that they have taken appropriate action to solve this problem for the future.

- Expansion Joint Failures - the corrective action following the catastrophic failure of two non-safety-related elastomeric piping expansion joints appeared to adequately address expansion joints. The cause was lack of an effective inspection and replacement program for such joints. The DCISC considers this to have been a programmatic weakness at DCPD and categorizes it as a concern.
- Spent Fuel Cooling Events - DCPD had experienced two loss of spent fuel cooling events caused by inadequate clearances during maintenance activity. PG&E appeared to have taken appropriate actions by adding additional instrumentation and alarms..

**The DCISC has found the DCPD Corrective Action Program satisfactory in previous periods.**

#### 4.6.2 Current Period Activities

##### **Follow-up on Corrective Action from September 22, 1999 Reactor Trip**

The cause of the September 22, 1999 reactor trip was a lightning strike in the 500 kV switchyard. Although the reactor trip was handled well by operators, there were some weaknesses noted: Operations and Chemistry were not aligned on planned condenser tube leak searches, more PA announcements were needed, there were some problems in securing the AFW pump, the four-hour emergency report to NRC was late, communication between the control room and 500 kV switchyard was less than optimal, and the Spent Fuel Pump was not noted to have tripped until regular rounds on the next shift.

Later, when attempting to restart the reactor, the reactor was manually tripped due to an inadvertent transfer from auxiliary power (backfeed) to start-up power. The transfer resulted from switchyard operators not advising the Control Room when resetting the overvoltage trip relay, contrary to the requirements of restart policy. This was considered non-cognitive personnel error on the part of the switchyard operator.



The physical electrical control system changes appeared to be adequate; however, the DCISC plans to follow up on the problems between the Control Room and switchyard.

#### **INPO SOERS 98-1 and 98-2**

The DCISC reviewed the DCPD response to Significant Operating Experience Reports (SOERS) 98-1 (Safety System Status Control, August 17, 1998) and 98-2 (Circuit Breaker Reliability, September 18, 1998).

DCPD completed its implementation, and review of the implementation summary indicated that the implementation appeared satisfactory and that PG&E had taken a very proactive role in looking into these problems.

#### **May 15, 2000 Fire and Unusual Event**

The event had begun with an 12kV electrical bus overload causing a fire which caused the loss of various pieces of electrical equipment and ultimately led to a turbine trip and an automatic Unit 1 reactor trip in accordance with the plant design. Steam relief following the trip was through the plant main steam safety valves to the atmosphere.

During the fire, reactor trip and main steam safety valve opening, the plant responded normally, and operators shut down the plant satisfactorily. Operators correctly used Emergency Operating Procedures to classify the event as an Unusual Event and to perform notifications to NRC, San Luis Obispo County and State of California officials.

The initial NRC press release warned that the steam released probably contained small amounts of radioactivity. While technically accurate, the news release failed to explain until later that radiation monitors in and around the plant could not detect any radiation above background and that any release was so small as to not pose a public safety threat. The news release led to much public confusion and many phone calls.

The NRC admitted that it unnecessarily alarmed the public into thinking it was being irradiated and is looking at ways to do a better job of explaining the technical aspects of radiation at the plant. PG&E is pursuing communications improvements based on this event and on communications problems at the May 10, 2000 annual emergency exercise. The DCISC is following PG&E's actions on emergency communications initiatives.

## Corrective Action Program

In the previous reporting period the DCISC had recommended that DCPD benchmark other plants with strong CAP effectiveness processes. DCPD had reviewed DCPD actions. PG&E reported on several external reviews/assessments of DCPD CAP. These were

- NEI Benchmarking, which found that (1) the DCPD Plant Information Management System (PIMS) is usable but not up to industry best practices and (2) DCPD is just beginning to develop leading indicators of the effectiveness of its CAP.
- INPO reviews found that (1) DCPD was not reporting or learning enough from low-level Action Requests (ARs) and (2) the AR Review Team was a strength.

The DCISC Team reviewed the current three-year plan (CAP/HP Programmatic Upgrade Action Plan) The plan appeared comprehensive, and most actions had been completed. The remaining items were to be completed by early 2002.

NSOC has been reviewing the CAP and is carrying it as an open item. NSOC has established a CAP Subcommittee, which began to review CAP following Outage 2R10. The DCISC plans to review this at the next NSOC meeting it observes (see Section 4.11.2).

DCPD is developing leading and lagging CAP effectiveness indicators. The DCISC reviewed the lagging and leading indicators developed to date. Lagging indicators had been formulated for the following areas:

- Problem identification (trend of numbers of ARs initiated)
- Problem review (six measures of timeliness of reviews and numbers of QEs and NCRs)
- Problem analysis (four measures, including cause analysis average age, NCR rejection rate, and quality grade of QEs and NCRs)
- Timeliness of corrective actions (seven measures, including various corrective action document average ages, actions overdue, etc.)
- Effectiveness of corrective actions (three indicators: percent NCRs and QEs evaluated as effective and number of recurring events in last year from previous QEs and NCRs)

The DCISC believes these are appropriate measures, the most important being the evaluations of corrective action effectiveness and number of recurring events.

Leading indicators included:

- Numbers of Event Trend Records (ETRs) generated
- Trends of management observations
- Adverse trend identification
- Proactive culture acknowledged (e.g., "good catches")

The leading indicators were still in stages of early development.

The DCISC believes that human skills play an important role in analyzing for root causes and developing effective corrective action. It was not apparent that the Human Performance Program and the CAP were closely tied at DCPD. This would seem prudent given that human error is the most prevalent event cause code. Training of personnel in corrective action processes should include such skills as effective interviewing in that much of the information utilized is obtained from personnel involved in the event. Personnel analyzing events, which are primarily caused by human error, should be knowledgeable in human cause characteristics in addition to the traditional system and equipment cause characteristics.

The DCPD Corrective Action Program appeared to have been improved as a result of self-assessments, external evaluations and reviews of other plant CAPs. Measures of program effectiveness were just being developed and appeared headed in the right direction. The DCISC will review the CAP in early 2002, following completion of improvement action items and the next self-assessment.

Because the predominant cause of events is human error, the DCISC believes that DCPD should more closely coordinate the Corrective Action and Human Performance Programs and utilize training in human characteristics and skills (e.g., interviewing skills, human error characteristics) for personnel preparing root cause analyses and corrective actions.

#### Winter Storm Experience/Procedures

DCPD's policy is to maintain the plant in a safe condition while maintaining a low reactor power level. From reviews of

the program, it appeared that DCPD had developed an effective tool and process for responding to winter storms without having to shut down the plant.

The plant storm response had been based on the "P9" plant protection level of 15% power for the most severe storms. In this case PG&E could take the plant down to approximately 15% power (with a turbine trip but without need for the condenser circulating pumps, the component most affected by the storm) and ride out the storm without having to scram the reactor. DCPD had raised the limit of the P9 protection level from 15% to 50% along with the new Standard Technical Specifications; however, procedurally DCPD would now normally run back to 20% (maximum limit of 25%). This decision (and a decision to shut down) is made with the aid of a prepared storm evaluation chart and a plant simulator run. The evaluation sheet includes such parameters as swell strength, wind direction and strength, kelp loading, etc. If a storm is severe enough, the plant will be fully shut down.

During the December 22, 2000 storm, the plant was taken to 50% power, but lost a circulating pump due to a high kelp loading and was taken to 20% to ride out the storm. It then returned to full power upon return of the second circulating pump. A January 2001 storm was very severe but with low kelp loading, and the plant rode it out at 20% power for two days before returning to full power. DCPD analyzes each storm for improvement of both procedures and equipment.

Upgrades were being considered to the components most affected by storms, e.g., the intake traveling screens. Larger motors are planned for installation during outage 2R10, and a new bar rack cleaning device is being evaluated.

DCPD appears to have satisfactory plans and equipment for responding to winter storms with the ability to maintain the plant in a safe condition. The DCISC will continue to monitor DCPD winter storm plans and experience.

#### 4.6.3 Conclusions and Recommendations

PG&E appears to have taken appropriate actions in response to plant off-normal operating events and system and equipment problems during this period and has applied appropriate corrective actions to prevent recurrence. The

DCISC will continue to review this area as part of its normal activities.

The DCPD Corrective Action Program (CAP) appears to have been improved as a result of self-assessments, external evaluations and reviews of other plant CAPs. Measures of program effectiveness were just being developed and appeared headed in the right direction. The DCISC will review the CAP in early 2002, following completion of improvement action items and the next self-assessment.

R01-2      Because the predominant cause of events is human error, it is recommended that DCPD more closely coordinate the Corrective Action and Human Performance Programs and utilize training in human characteristics and skills (e.g., interviewing skills, human error characteristics) for personnel preparing root cause analyses and corrective actions.

## 4.7 Environmental

### 4.7.1 Overview and Previous Activities

The DCISC's responsibility is reviewing DCPD operational nuclear safety; however, some of those activities and items reviewed have related non-radiological environmental aspects. Where this is the case, the DCISC reviews the environmental areas as well. (Radiological matters, including radioactive releases, are reported in other sections of this report). Environmental concerns DCISC has reviewed in previous periods include:

- Underground Diesel Fuel Oil Tank Replacement
- Auxiliary Transformer 1-1 Failure
- Intake Screen Fouling by Kelp during Storms
- Polychlorinated Biphenyls (PCBs)
- Elimination of BioLab
- Annual Summary Report on Discharge Monitoring

**The DCISC had previously concluded that the DCPD environmental program was satisfactory.**

### 4.7.2 Current Period Activities

During the current period, DCISC reviewed the Environmental Program for 1999 and first half of 2000 at the July 6 & 7, 2000 Fact-Finding Meeting (Volume II, Exhibit D.1) and at the March 14-16, 2001 Fact-Finding Meeting (Volume II, Exhibit D.6) for the year 2000.

PG&E reported the following results for 1999:

- All required regulatory submittals and correspondence were completed on-time
- One reportable release to the environment: approximately one ounce of hydraulic fluid was released from the kelp harvester and cleaned up
- One exceedance of the NPDES effluent permit limitation at an intermittent point: a contractor left an oil residue in an empty container
- Three environmental agency inspections.
- No unusual or important environmental events related to plant operation

There had been no violations or potential violations for 2000 at the time of the fact-finding.

There were no significant findings reported in the environmental audits and inspections that were performed at DCPD.

The DCISC reviewed PG&E's 1999 annual submittal of the non-radiological environmental operating report to the NRC. The reports and activities were routine, and with several exceptions (Volume II, Exhibit D.1), there were no unusual or important events or violations.

During 2000, there were two agency inspections. The inspection of hazardous waste resulted in one minor issue on the separation distance between storage pallets and control methods for satellite accumulation areas. Corrective action is planned, and neither is expected to be a problem.

There was one minor spill during the year 2000. This was the loss of about one ounce of hydraulic fluid into the intake bay from a kelp harvester. Although trivial in severity, the event was reportable because it produced a sheen on the water. The spill was cleaned up quickly.

An entrainment study report was submitted in March 2000 to the Regional Water Quality Control Board. The Board had issued a draft report, and PG&E was resolving outstanding issues. The primary resolution to settle impingement and thermal effects issues was to set aside land for conservation. This was not expected to affect plant systems or operation.

#### 4.7.3 Conclusion

DCPD environmental performance appeared satisfactory, and the DCPD environmental program appeared to meet applicable requirements. The DCISC will continue to review the environmental program as part of its normal activities.

## 4.8 Fire Protection

### 4.8.1 Overview and Previous Activities

Fire protection requirements are contained in NRC's regulations in 10CFR50 Appendix R. Appendix R specifies the minimum requirements for safe shutdown systems and equipment, fire hazards analysis, prevention, detection and mitigation, fire brigades and training, emergency lighting, fire barrier and penetration qualifications, and fire doors. PG&E has committed to implementing these requirements, utilizing interpretations and deviations approved by NRC. The NRC periodically performs inspections of the DCPD fire protection program implementation.

The DCISC has looked into the following aspects of DCPD fire protection:

- Public comments and concerns about discrepancies identified in NRC inspection reports - these concerns were being addressed satisfactorily.
- NRC inspection reports and PG&E LERs on fire protection, along with PG&E's responses and corrective actions - responses and corrective actions were adequate.
- Failures of Thermo-Lag 330 insulation - fire watches were established, and these deficient materials were replaced satisfactorily.
- Risk of using highly combustible gases in vital areas - this matter was satisfactorily addressed.
- Erosion/corrosion and microbiological impact on the fire water system - PG&E has an effective program to monitor and address potential problems.
- Pyrocrete insulation inadequacies - satisfactory fire watches and corrective actions have been applied.
- Penetration Seal Project - a large number of deficient penetration fire seals was compensated by fire watches and a major long-term program of replacement seals. The program was expanded to include High Energy Line Break (HELB) and Medium Energy Line Break (MELB) seals and building gap seals. PG&E completed the program in mid-2000.



- Fire Protection Water System - the DCISC met with the Fire Protection Water System Engineer to review the design, problems and current activities on the system. The major problem was corrosion, which was being adequately addressed. The system appeared satisfactory, and the System Engineer appeared knowledgeable.
- NRC Fire Protection Inspection - in April 2000 the NRC performed a comprehensive triennial fire protection baseline inspection of DCP. The NRC did not identify any discrepancies and determined that the overall measure of the Mitigating System Cornerstone was "Green", the best rating.

The DCISC concluded in previous periods that the DCP Fire Protection Program appeared adequate.

#### 4.8.2 Current Period Activities

The DCISC did not perform any reviews of the DCP Fire Protection System during this reporting period, based on its satisfactory reviews in the previous period and on satisfactory results and conclusions in NRC's comprehensive fire protection inspection in April 2000 (above). The DCISC plans a fire protection review in the next period.

#### 4.8.3 Conclusions

Based on satisfactory DCISC and NRC reviews and inspections in the previous reporting period, the DCISC did not review fire protection in the current reporting period. A DCISC review of fire protection is planned for the next period.

#### 4.9 Human Performance

##### 4.9.1 Overview and Previous Activities

The goal of the human performance program is to reduce the number of human errors and improve the safety of plant operations by improving human performance. In past reporting periods the DCISC has reviewed the following aspects of human performance at DCPD:

- The Human Performance Fundamentals Course
- The Human Performance Evaluation System (HPES)
- Human Performance Improvement Program (HPIP)
- Effect of rotating shift-work on performance of Control Room Operators'
- Physical fitness of Control Room Operators (CROs)
- Stress Intervention classes
- The implementation of Asset Teams

During the previous period (July 1, 1999 - June 30, 2000), the DCISC reviewed the following Human Performance items/programs:

- Operator Health and fitness: DCISC recommended that PG&E augment its programs for operator health and aging to consider such areas as "operator aging management", to include physical fitness, and mental alertness (especially on night shift) to further improve operator human performance. PG&E responded with the following actions:
  1. Classes on health-related topics were held for Operations crews every other five-week training cycle.
  2. PG&E was providing additional break time and encouraging use of the fitness facility for watch-licensed personnel.
  3. The DCPD medical staff was further evaluating its operator fitness levels.

The DCISC accepted this response and continued to monitor this issue.

- "Centers of Excellence": In early 2000, six Centers of Excellence replaced the SPARK Team. They act as coaching resources to provide a pool of expertise in support of the various processes.

- Fitness for Duty and Employee Assistance Program (EAP):  
The substance abuse program revealed a slight increase in positive results in random testing over 1998. The two EAP contractors appear to be fulfilling their duties adequately.
- The Medical Center provided routine physicals, follows employees' health problems, and provides plant-wide health and fitness programs, such as stress reduction. With sufficient support, they would be capable of incorporating more specific programs addressing self-regulation (stress reduction, attention enhancement), disease prevention/health maintenance, and effects of aging on operators.

It appeared in previous periods that the DCPH Human Performance Programs for the various Departments could be effective in reducing human errors, although definitive improvement has not been evident.

#### 4.9.2 Current Period Activities

The DCISC reviewed the human performance at DCPH during the current reporting as described below.

##### **Human Performance (HP) Program**

HP has the full support of plant management, with a steering committee of senior managers, and working committees representing the various departments. They meet monthly to review plant HP data, and provide systems for error prevention.

The monthly human error rate (errors/10,000 workhours) has fluctuated over the last several years, typically peaking during outages. The rate peaked in July 2000 (non-outage) at about 1.5, dropped a little and rose to 1.45 during outage 2R10 in October. It dropped to about 1.1 at year-end. In early 2001 the rate had bettered the DCPH goal of 0.9 at about 0.7 but had an increasing trend through May.

There was a 40% reduction in HP errors from outage 1R10 (at 1.5) to 2R10 (at 0.9) in May 2001. Outage 2R10 had the lowest error rate yet -- only one error. The previous record was 3. Another dramatic improvement was that maintenance had gone 3 successive outages without a significant error.

About 40-50% of the errors occurred in Maintenance and Operations. These groups represent the main sources of human error because they are hands-on, while other, more management-type errors are less immediately detectable. The goal is to reduce the error rate consistently to earlier lower levels.

The following actions have been initiated:

- An improved Management Observation Program (MOP) was introduced in August 2000 with more focus on behavior and less on results.
- Maintenance began using EPRI's "Payoff," a database with input from front line workers and first line supervisors who answer a set of basic questions, allowing targeted self-assessments based on ATR reports
- The HP Group began tracking observable behaviors in Operations, and will be picking the top 8-12 objectives to prevent errors. They have action plans to develop observable behaviors that will meet specific objectives.
- As part of the transition from Work Function to Work Process, a new tailboard observation and feedback program was instituted in Maintenance Services to help shape future work procedures.
- An increase in pre-work simulations was a large contributing factor to the low error rate during the 2R10 outage. This included classroom work with maintenance mock-ups, providing an opportunity to practice and become familiar with equipment and procedures and to anticipate possible error situations.
- Supervisor communications training is an important component, as well, and is discussed in Section 4.20 (Training).

#### **Personnel Accountability Policy**

DCPP is using an Personnel Accountability Policy (AP) based on creating an environment in which errors are routinely reported, and individual consequences, both positive and negative, are aligned with individual performance. Errors can be reduced by minimizing contributing factors, and by applying corrective actions in order to prevent more significant

occurrences in the future. (Volume II, Exhibit D.1, Section 3.3). It appears to take a complete range of factors into account, and provides a useful tool for tracking HP and correcting errors.

### **Human Performance Measures for Engineering (Latent Errors)**

There is a separate Engineering HP Committee, with 10 sub-process owners. It meets twice a year and reports on performance, including evaluating event trend records (ETRs). A higher level of coordination among engineering, operations, and vendors is required for optimal results. Specific HP training for engineers began in Spring 2001. The DCISC plans to continue to follow engineering HP.

### **Informal Meeting With Supervisors to Discuss HP Issues**

An informal meeting was held between a DCISC Member and consultant and 16 supervisors from various departments including Engineering, NQS, Chemistry, Radiation Protection, Operations, Security, and Maintenance. The purpose was to gain an understanding of human performance at the work group level. Following are some of the issues discussed:

Chemistry/Environmental has been downsized, leaving workers feeling overburdened, and with some resistance to the additional responsibilities of an HP program.

#### **Safety Group:**

- Due to efforts of engineering and maintenance, AR's are now handled on average within 130 days, as opposed to the previous average of 600 days.
- Documented ETRs (event trend records) increased from 30% to 75%. Seven self-assessments were done in engineering in 2000, and then used to identify processes to observe next year.

#### **Maintenance:**

- Craft wanted feedback about how data is being used, and what is being done as a result, even if it's used only for trending.
- More important than the actual data collected, is the worker's desire to have the supervisors present in the field.
- Operations appears to have the opposite experience. Being more independent, they resent feeling under scrutiny. To

improve the situation, they request that critiques be oriented toward acknowledgment for what is being done correctly, and not just what is wrong.

- Behavioral observation class in Operations has an accompanying video which works well as a teaching tool. The training department plans on a similar one for Maintenance.
- Department-specific observation cards were instituted by HP.
- After initial resistance, craft is now more enrolled in the HP process. Successful implementation of the "we culture" was reflected during the 2R10 outage, with excellent interdepartmental cooperation.

DCPP supervisors seemed very open in their discussion of Human Performance. Issues have been recognized and are being acted upon.

#### **Meeting with Human Resources Director**

The DCISC met with the Human Resources Director who described the Culture Transition Initiative, which was developed following concerns identified by the Synergy Safety Culture Survey. The Initiative is being taken to improve trust in management and create an improved safety conscious workforce. The Initiative is based on developing the five following behaviors:

1. Understand others
2. Embrace feedback
3. Provide face time
4. Develop and support common goals
5. Create a positive work environment

She described the series of training sessions which have taken place with top management, middle management and employees. She also described the bi-monthly meetings held with supervisory levels at the plant and the 360-degree personnel performance feedback process for each manager/supervisor. The DCISC has been following this initiative since its inception.

#### **Employee Assistance Program**

EAP duties are shared by two part-time counselors, each working 15 hours per week. Based in the administration building, office hours are from 8:30 AM to 3:00 PM except during outages, when they are from 2:00 PM to 9:00 PM, with 24/7 availability by phone for emergencies. The EAP staff also

attends Fitness for Duty meetings, and trainings in San Francisco. Despite the energy crisis, overall morale appears to be stable. (Volume II, Exhibit D.9, Section 3.4).

EAP counselors teach the monthly behavior observation class, monitor the Fitness for Duty (FFD) program, and provide counseling on job-related issues. For other problems, employees are referred to local therapists and psychiatrists, where prior authorization allows an immediate 10 visits which are covered by the company health insurance plan.

EAP plans on doing more team counseling and offering more classes and affinity groups (e.g., aging parents, parents of teenagers) which allows the employees to share information, resources, and overall mutual support.

EAP distributes two informative quarterly publications, published under contract by Value Options, one for the entire plant and one geared to supervisors.

**EAP appears to be well utilized, is carrying out its responsibilities appropriately, and has creative plans for the future.**

#### **Operators' Physical Fitness, Attention Enhancement, and Stress Management**

The DCISC met with the new Director of Operations to discuss incentives for increased physical fitness, attention enhancement, and stress management, an ongoing concern of the DCISC and of the medical center. (Volume II, Exhibit D.4, Section 3.6).

PG&E Policy OP1.DC12, Conduct of Routine Operations, recognizes the need for activities that enhance alertness, such as a nutrition or exercise breaks, a rest period, or taking a shower. Two thirty-minute breaks per 12 hour shift are allowed, as long as there is adequate coverage while the operator is relieved from duty, and s/he must then be available by phone, pager, or radio. (Volume II, Exhibit D.9, Section 3.1).

HP is considering a program referred to as the Sleep, Activity, Fatigue, and Task Effectiveness (SAFTE) model. A questionnaire-based computer program, The Fatigue Avoidance Scheduling Tool (FAST) calculates an individual's pattern of alertness/fatigue, and allows team scheduling based on the

individual findings. Based on the timing and amount of sleep an individual or team receives prior to and during the period, effectiveness predictions provided by FAST enable planners to optimize work/rest schedules for up to 3 weeks.

Operator fitness continues to be an issue. The current Operations Director's appreciation of its importance, and his background as an operator are both positive influences in this area. Human Performance issues are being addressed appropriately as well.

#### **Meeting with DCPD Medical Director**

The Medical Director is concerned, as has been the DCISC, about Operators' health and fitness (Volume II, Exhibit D.4, Section 3.11). He discussed the American National Standards Institute (ANSI) requirements for Aerobic Fitness.

PG&E's medical form has a "no solo" category for licensed operators who do not meet the required 7.14 mets (a measure of physical fitness). They are then not allowed to be the sole licensed operator in or out of the control room. The ultimate decision is left to the discretion of the supervising physician. Because there are four licensees in the control room at all times, this is unlikely to be a significant problem; however, the issue arises as to how many "no-solos" can one have at a time on a shift, especially during an emergency.

Most of the "no-solos" are simply out of shape. There is an upward trend in weight gain, which is a marker of lifestyle. Old statistics on non-solos, from 1994-1998, indicate that 20% were under 7.2 mets. Updated statistics will be available after chart review in preparation for an NRC audit in April.

The medical center continues to work diligently at screening, treating, and counseling employees. The lack of specific incentives makes their job more difficult in terms of compliance. Incentives for fitness would likely provide more motivation, as it did in security.

#### **Safety Class On Cardiac Health**

The Medical Director taught a one-hour class on cardiac health, part of the health series, previously discussed by the DCISC (Volume II, Exhibit D.4, Section 3.10). The class credits each attending employee with one Safety meeting.



He explained new diagnostic tests, treatments, preventive measures, and risk factors. These factors increase with age, and include smoking, lack of exercise, poor diet, high cholesterol, and high blood pressure. He described the various screening procedures, symptoms of a heart attack, treatment, and follow-up lifestyle changes and medications.

The safety class on cardiac health was well attended, with an enthusiastic, involved audience. Covering complex material in an understandable way, the class made an excellent contribution to the health of employees and their families.

It was clear that the employees have a close and trusting relationship with medical center personnel, with many staying afterwards to ask questions or otherwise touch base with the doctor.

#### 4.9.3 Conclusions and Recommendation

The Human Performance Program is doing an adequate job of error trending, evaluating the data, and working toward increasing performance and enhancing safety. Human error continues to be the largest cause of problems, and, although the numbers of human errors are small, the trends are not yet showing sustained improvement. The DCISC will continue to actively review human performance at DCPD.

The DCPD Employee Assistance Program appears to be well utilized, and is carrying out its responsibilities appropriately. The DCISC will review this area as part of its normal activities.

Operator fitness continues to be an issue of concern, which the DCISC will continue to track. Indicators point to a growing problem with operator fitness, and it was not apparent that DCPD had measures in place to deal with the problem.

R01-3      It is recommended that PG&E continue to augment its programs for operator health and aging to consider such areas as operator "aging management", physical fitness, and mental alertness on shift to further improve operator human performance.

#### 4.10 Nuclear Fuel Performance/Fuel Cycles/Storage

##### 4.10.1 Overview and Previous Activities

The DCISC has been following performance of nuclear fuel and fuel-related matters at DCPD since its beginning in 1990. The Committee receives regular reports on nuclear fuel performance and any problems from PG&E both in fact-finding and public meetings and as input to the annual report. DCISC follows-up on problems and activities in its fact-finding meetings at DCPD and PG&E Headquarters.

DCPD fuel reliability is the most important fuel attribute monitored during operation. It is important to assure that the fuel integrity is preserved to avoid fission product leakage into the reactor coolant system (RCS) and ultimately into RCS cleanup and support systems resulting in increased personnel dose, radioactive waste and potential off-site releases.

Since DCISC was formed in 1990, fuel reliability had been excellent until November 1994 when Unit 2 fuel began to show signs of leakage and experienced localized fuel damage. Leakage is measured by the amount of radioactivity in RCS samples, with a current goal of less than  $5.0 \times 10^{-4}$  microCuries ( $\mu\text{Ci}$ ) of Iodine-131 per gram of coolant. The following depicts the measured (and corrected) radioactivity trend for a five-year period:

<u>Period</u>	<u>Goal</u>		<u>Unit 1</u> <u>Actual</u>	<u>Unit 2</u> <u>Actual</u>
96-97	$5.0 \times 10^{-4}$	$\mu\text{Ci/gm}$	$1.47 \times 10^{-5}$	$1.0 \times 10^{-6}$
97-98	$5.0 \times 10^{-4}$		$5.75 \times 10^{-5}$	$1.0 \times 10^{-6}$
98-99	$5.0 \times 10^{-4}$		$3.14 \times 10^{-5}$	$3.06 \times 10^{-4}$
99-00	$5.0 \times 10^{-4}$		$1.0 \times 10^{-6}$	$9.06 \times 10^{-4}$
00-01	$5.0 \times 10^{-4}$		$1.0 \times 10^{-6}$	$5.41 \times 10^{-4}$

In addition to regular fuel performance updates, DCISC has investigated the following fuel-related topics:

- Spent fuel pool safety issues - as a result of a public concern, the DCISC met with the Spent Fuel Pool (SFP) System Engineer to discuss the Spent Fuel Pool Cooling System and related issues. PG&E had performed an adequate assessment of these items and concluded there was not a concern at DCPD.
- Future plans for additional spent fuel storage - without the Department of Energy spent fuel storage facility, DCPD must have a solution to its spent fuel storage problem in place

by 2006. Plans and long-lead activities have been initiated for on-site dry cask storage. The DCISC continues to follow this matter.

- Boraflex Degradation - boron is leaching out of Boraflex sleeves in the spent fuel pool racks and potentially compromising the neutron absorption ability of the Boraflex to maintain subcriticality. DCPD plans to revise its spent fuel pool criticality analysis taking credit for soluble Boron in the spent fuel pool water and submit a corresponding license application change to NRC. Three other stations have received NRC approval on similar applications.
- Stuck Control Rods - stuck control rods, or incomplete rod insertion, first appeared in high-burnup French reactors, in which control rods bowed and would not fully insert. The problem has been shown to not affect DCPD, and the DCISC considers the issue closed
- Axial Flux Axial Offset Anomaly - Axial flux offset anomaly is an unexpected deviation of the actual reactor core axial flux offset compared to predictions. It was not a problem at DCPD, and the issue was closed.
- Fuel Pellet-Gap Re-opening - a problem in high exposure fuel in which the normally closed fuel pellet and clad gap re-opens, potentially causing corrosion. The fuel manufacturer has determined the condition is not a safety issue. Westinghouse and PG&E are awaiting NRC's review of their fuel model to begin a new fuel design, which should eliminate the re-opening problem.
- ATWS Moderator Core Temperature Coefficient - DCPD was licensed with a 5% positive moderator temperature coefficient (PMTTC). NRC has been reviewing the effectiveness of plant ATWS mitigating system (AMSAC) with coefficients this positive. Analyses have been performed, but this is an open NRC issue, and the DCISC plans additional reviews following NRC's review.
- Unit 2 Fuel Leakage - PG&E began seeing the first indications of Unit 2 fuel leakage on August 20, 1998. Upon inspection of spent fuel in Outage 2R9, two leakage problems were found. The first was a pinhole leak in an internal assembly fuel rod. The leak was believed to have been caused by either core debris or a material defect. The leak had closed itself up after opening. The second area of damage was the first occurrence of baffle jetting experienced at DCPD. Corrective action was to add corner fuel clips to susceptible corner assemblies. Baffle-jetting

effects were also found on Unit 2, cycle 8 fuel upon a review of fuel inspection videotapes.

- Nuclear Fuels Group Transition - the transition of the nuclear fuels group from San Francisco to DCPD appeared to have been performed effectively
- Fuel Assembly Top Nozzle Leaf Spring Problem - during inspection of spent fuel removed from the core in outage 2R9, a problem was discovered with the Top Nozzle Leaf Springs in several fuel assemblies; however, no fuel damage resulted. Root cause analysis indicated the cause was over-torquing of the bolts in a specific batch of Westinghouse fuel. DCPD performed a justification for continued operation and did not allow any susceptible assemblies back into the core. Unit 1 did not contain assemblies from this batch of fuel.

**The DCISC concluded that PG&E appeared to be handling fuel or fuel-related problems appropriately in previous periods.**

#### 4.10.2 Current Period Activities

The DCISC has investigated the following items during the current reporting period:

##### **Spent Fuel Storage Status**

PG&E has selected dry cask storage and has a letter of intent with the contractor, Holtec. A project team has been formed at an off-site location and consists of Engineering, Licensing, QA, Community Affairs, Environmental, Legal, Contracts, and Land Use Permitting.

The two license applications will be submitted to the NRC in August (10CFR72) and September 2001 (10CFR50) for the 138-storage cask facility. This will accommodate all spent fuel and complete off-load for the 40 year license life. The land use permit will also be for full storage. The building permit will be in two stages, first phase for one half storage and second phase for the other half in 2017. DCPD will license both 32 and 24 assembly storage canisters. The storage cask system will be anchored because of seismic conditions.

The facility needs to be completed by 2006. The preliminary engineering design was completed by 12/2000 and final design by 3/2001. They are also working on security requirements and radiation monitoring. A Project Oversight committee has been

formed and the License Application will be reviewed by PSRC. The facility work has also been coordinated with Operations, Maintenance and Environmental.

PG&E has sent letters to County Supervisors, Government Agencies, Concerned Citizens, and Intervenor Groups. They have also called State Elected Officials and Local Reporters as well as holding meetings with County Officials and County Planning Supervisors. A web site has been developed for project information. They also plan on having small public meetings to give out information.

**It appears that PG&E is taking appropriate action to design and license on-site spent fuel storage facilities in a timely manner to safely accommodate all plant generated spent fuel. They are also informing the Government Officials and the Public in a timely manner.**

#### **1R10 Nuclear Fuel Performance/Inspection**

DCPP did not have any indications of leaking fuel during the past Unit 1 fuel cycle and did not find any during the inspection. DCPP has never had any leaking fuel in Unit 1 but did find a large number of failures of the top nozzle spring screws with the twice-burned fuel assemblies. The screws are breaking, but there were no loose parts. Westinghouse identified this problem after 1R9 at other plants and DCPP found this problem in 2R9 and 1R10. Fuel inspections conducted during 1R10 showed fewer top nozzle spring screw failures than 2R9 inspections.

DCPP prepared an Operability Evaluation to document the operability of Units 1 & 2 utilizing Westinghouse fuel assemblies with potentially fractured top nozzle spring screws. The evaluation demonstrated that plant operation utilizing fuel assemblies with fractured top nozzle hold down spring screws will not have an adverse effect on the integrity of the components of the reactor coolant system or connecting systems. The fix will be a different type of material for the screws. DCPP will go to a new design for fuel to be installed during 1R11 and 2R11, but may still have this problem through cycle 1R12 and 2R12.

**PG&E appears to be taking appropriate actions dealing with the top nozzle spring screw failure and has prepared an Operability Evaluation addressing the issue.**

## **Gap Re-Opening**

Nuclear fuel is designed with a gap between the nuclear fuel pellets and the surrounding zircaloy cladding. During operation the fuel pellets swell, closing the gap. Operating models assume the gap remains closed; however, it has been determined that the gap can re-open in some fuel locations, adversely affecting heat transfer from the pellet through the clad. This condition can cause excessive corrosion of the clad. PG&E and Westinghouse had determined that, although DCPD did not achieve desired margins with then current fuel designs, safe operation was not affected. DCPD has recently revised its Operability Evaluation (OE) for fuel with pellet-clad gap re-opening and clad oxidation concerns.

Westinghouse has completed a gap re-opening and clad oxidation assessment for Unit 1 Cycle 11 that shows that gap re-opening will not occur and that clad oxidation will remain within limits. Based on this assessment and conclusions, the OE can be closed for Unit 1.

Westinghouse has also completed a gap re-opening and clad oxidation assessment for Unit 2 Cycle 11. This assessment shows that gap re-opening is predicted to occur first in the Region 9A center assembly and in Region 11A and 11B fuel. Based on the Westinghouse analysis for Unit 2 condition of the fuel pellet clad gap re-opening, the core is operable within license conditions. Also, the 10 CFR 50.46 limit of 17% total localized oxidation is met. The OE will be reviewed with the PRSC prior to the Unit 2 restart from 2R10.

**PG&E appears to be taking appropriate actions to deal with the fuel pellet gap re-opening problems and has resolved the issue on Unit 1. This issue should be resolved in Unit 2 when a new fuel design is installed in 2R10. The DCISC should review the status of gap re-opening in 2001 when Westinghouse has resolved the issue.**

## **Extended Fuel Cycle**

The fuel cycles for DCPD were originally designed for 12 months and DCPD has been moving toward a 24-month cycle. However, because of potential technical problems, they have settled on a 21-month fuel cycle. DCPD continues to evaluate cycle lengths as economics may change and as they participate in the STARS Initiative, whose members favor an 18-month cycle.

The DCISC will review fuel cycle length again in late 2001, if PG&E has changed their plans.

#### **Boraflex**

There has been no change in the Boraflex degradation issue since the last reporting period (see Section 4.10.1 above).

#### 4.10.3      Conclusions

PG&E appears to be handling fuel or fuel-related problems appropriately. The DCP Unit 1 core has been reliable and clean; however, Unit 2 has experienced a small amount of fuel damage due to baffle jetting and debris or a fuel defect. The assembly was removed, repaired and returned to the reactor. It appears PG&E will maintain its 19-21 month fuel cycle or move to an 18-month cycle.

The DCISC will continue to follow on-going problems such as expansion of spent fuel storage, spent fuel pool poison (Boraflex), and any fuel-related fuel problems or issues that arise.

#### 4.11 Nuclear Safety Oversight and Review

##### 4.11.1 Overview and Previous Activities

Nuclear Safety Oversight and Review (NSOR) is an important function in the safe operation of nuclear power plants. NSOR represents an independent, higher and/or broader level of review of operations, events, occurrences, etc. than can be obtained from the organizations performing the day-to-day plant, technical and quality functions. NRC regulations require, and DCPD Technical Specifications (TS) provide for, a high level of oversight in the form of the Nuclear Safety Oversight Committee (NSOC).

PG&E has in-place the following review and oversight organizations/functions:

- President's Nuclear Advisory Committee (PNAC)
- Nuclear Safety Oversight Committee (NSOC)
- Independent Safety Engineering Group (ISEG)
- Technical Review Groups (TRG) for Specific Issues
- Plant Safety Review Committee (PSRC)

In addition, PG&E has procedures to establish, on an ad hoc basis, Event Investigation Teams for significant events.

Additionally, the nuclear industry seeks operational safety and excellence with the Institute of Nuclear Power Operations (INPO) which performs periodic performance evaluations of each operating nuclear plant; coordinates the collection, review and dissemination of operating event information; issues good practice guidelines; provides specific event, technical and functional reviews; and issues and monitors performance goals for the industry. PG&E is a member of INPO and participates in their programs.

Finally, the Nuclear Regulatory Commission (NRC) is charged by law to regulate the nuclear industry. In carrying out this responsibility the NRC issues regulations and guides for nuclear safety and performs inspections at facilities to assure regulations are met. NRC's role at DCPD is discussed in Chapter 3.0 NRC Assessments and Issues.

The Diablo Canyon Independent Safety Committee (DCISC) provides an additional level of nuclear safety review and oversight. As stated in Chapter 1.0, DCISC is charged to " .



. . review Diablo Canyon operations for the purpose of assessing the safety of operations and suggesting any recommendations for safe operations". In carrying out its responsibilities DCISC receives and reviews DCPD operating and technical and NRC documents; performs fact-findings at DCPD and holds several public meetings each year to hear PG&E reports on plant operational safety and receive public input.

As part of its program, the DCISC has monitored the operation and effectiveness of all levels of PG&E review and oversight since its inception in 1990. Since 1990, DCISC has reviewed the following organizations and functions:

- Review of PG&E safety committee and operating experience evaluation activities. The DCISC looked at the entire interfacing structure of review organizations.
- PG&E overviews of the structure of independent safety review groups to the DCISC at public meetings - PG&E has described the President's Nuclear Advisory Committee (PNAC), the Nuclear Safety Oversight Committee (NSOC), the Plant Staff Review Committee (PSRC) and the Nuclear Quality Services (NQS) Department.
- Nuclear Quality, Analysis & Licensing (NQAL) includes (1) Regulatory Services, (2) Nuclear Quality Services - Operations, Plant Support and Corrective Action, (3) Nuclear Quality Services - Engineering, Procurement & Maintenance, (4) Licensing Projects, (5) Nuclear Safety Employee Concerns Program, (6) System Transient Analysis and (7) Probabilistic Risk Assessment.
- Plant Staff Review Committee (PSRC). The PSRC was established to review overall plant operating and maintenance experience, proposed changes and tests, the adequacy of procedures, security, fire protection, environmental matters and other subjects which have a bearing on nuclear safety.
- DCISC Members and Consultants periodically attended regularly scheduled meetings of the President's Nuclear Advisory Committee (PNAC), Nuclear Safety Oversight Committee (NSOC), and Plant Staff Review Committee (PSRC).
- At each of the DCISC Public Meetings, PG&E gives a

summary of the activities of the NSOC and PNAC meetings held since the last DCISC Public Meeting.

**In previous periods the DCISC has concluded that the Nuclear Safety Oversight function has been carried out satisfactorily.**

#### 4.11.2 Current Period Activities

During this period, PG&E gave presentations at DCISC Public Meetings on September 14 & 15, 2000, February 7 & 8, 2001 and June 20 & 21, 2001 (Volume II, Exhibits B.3, B.6 and B.9) on the NSOC meetings held prior to each of these public meetings. PG&E reviewed the major topics discussed at the meeting and any conclusions, recommendations made and problems noted at the meetings. DCISC fact-finding teams reviewed the following President's Nuclear Advisory Committee (PNAC) and Nuclear Safety Oversight Committee (NSOC) activities at fact-finding meetings:

#### **Observation of NSOC/PNAC Meetings**

##### November 14, 2000 - Joint NSOC/PNAC Meeting

DCISC representatives attended the regularly scheduled meeting of the NSOC/PNAC held at DCPD on November 14, 2000 (Volume II, Exhibit D.3).

The DCPD NSOC/PNAC held one of its regular, scheduled meetings on November 14, 2000 at DCPD. The following items were discussed:

1. License Amendment Requests (LARs)
2. System Engineering Program and Management Expectations of System Engineers - A summary of the roles and responsibilities of system engineers was presented.
3. Subcommittee Reports:

A. Plant status and performance indicators: two human performance errors, one unplanned automatic reactor trip, the Unit 1 refueling outage were also discussed.

B. PSRC Summary: A summary of issues discussed at the PSRC meetings were reviewed.

C. LER and NOV summary: A summary of four recent licensee event reports (LERs) that were submitted to the NRC

was reviewed. Three NCVs that were issued during the last period were also reviewed. The trend of NCVs at DCPD is comparable to the average number received at other Region IV plants. One of the External Members pointed out that NCVs are no longer the best measure of performance and that management needs to be sensitive to monitoring problem trends at the plant.

D. LBIE Assessment: Twenty LBIE reviews were completed during the assessment period. There were no significant issues identified related to LBIEs.

E. NCR and NQS interest items: Three NCRs that were initiated during this period were discussed. The External Members felt two of the NCRs were weak, and that additional action is warranted to improve the NCRs and the root cause analyses. Additionally, they felt that the number of NCRs generated is low for a good performing plant.

NQS reviewed the projected 2001 audit schedule for DCPD and stated that the audit plan is integrated with self-assessment plans. They also stated that an audit of the self-assessment program will be performed as part to the audit of the quality assurance program for 2001.

4. QPAR and Performance Indicator Status: The third quarter QPAR was reviewed. The overall performance of NPG is satisfactory. Maintenance Services received a yellow window for this quarter. Part of the reason is continued human performance problems, continued problems with the lubrication program, and weaknesses in the maintenance training program.

All NRC performance indicators are green this quarter. However, the indicator for loss of normal heat sink and for ERO drill/exercise performance are near the threshold for being white.

5. Integrated Assessment Report: The integrated assessment report is intended to evaluate performance of the plant not addressed by specific performance indicators. The report is developed based on input from licensing, quality assurance and senior management regarding trends in performance. Five key performance areas were identified in the report as needing attention (Volume II, Section D.3). The Plant Manager has been assigned as the owner of this report.

6. Strategy to Address Human Performance Issues: The

human performance program is being revised to add more formality. The new program is based on the formation of a human performance steering committee. The purpose of the steering committee is to develop a common philosophy and strategy to address human performance improvement and champion human performance at DCPD.

7. RP and ALARA Program Strategies: This presentation included an overview of current RP and ALARA programs, and future direction and strategies. Both units are in the middle of the third quartile for RP performance in the industry. Although neither unit has ever had less than 100 person-Rem per outage, 1R10 was the lowest Unit 1 collective dose outage. Much of the reduced dose was due to good shutdown chemistry control and zinc injection over the last two years.

PG&E stated that DCPD intends to focus on being a top industry performer in this area. Dose is an indicator of efficiency of work processes. Shutdown chemistry initiatives need to be continued. Planning and scheduling of work needs to be improved.

8. Other Items: The Chairman of NSOC reported on his visit to the offsite review committee meeting of another nuclear utility. The Chairman is considering moving to a more formal subcommittee process and will continue to share observations of operation of other committees.

Overall, the PNAC/NSOC meeting was well planned, well organized and attended, and PNAC/NSOC appears to have fulfilled their required duties. There was an exchange of observations, opinions, and suggestions at the PNAC/NSOC meeting and good participation by the outside Members. It also appears to be very beneficial to have the joint PNAC/NSOC meetings, since each committee covers much of the same agenda. DCISC should continue to monitor some PNAC and NSOC meetings to observe their review of plant safety issues.

#### May 1 & 2, 2001 - NSOC Meeting

The following topics were discussed:

1. INPO Results - INPO evaluation reports and a summary of the evaluation results were reviewed. A description of corrective actions was also presented.

2. Bankruptcy Impact - DCPD considers the bankruptcy

"business as usual" regarding plant operations and management. The plant has its full 2001 authorized budget and expects the same in 2002. Management provides daily and weekly communications within the plant to keep employees current. There are weekly updates for the NRC, and there have been no adverse safety effects. There had been pressure from the Governor's office to not reduce power during ocean storms; however, PG&E will follow their procedures to reduce power when necessary to maintain plant safety.

3. NSOC Re-organization - The Chairman of NSOC discussed potential re-organization of NSOC. The Oversight and Corrective Action Subcommittee would remain. Human Performance and Equipment Performance Subcommittee are up for consideration and discussion.

Most significantly, STARS will have a Nuclear Safety Review Board initiative team, which the DCPD NSOC Chairman will lead. The STARS Team will review the regulatory compliance requirements to attempt to eliminate the requirement for NSOC but retain the function and combine resources for STARS plants. They anticipate having a proposal for the STARS Chief Nuclear Officers in about six months but maintain the status quo for one year.

4. Corrective Action Oversight and Assessment Subcommittee - The following items for this new NSOC subcommittee were reviewed:

A. NQS Audits and Assessments - the first quarter 2001 work products were reviewed. Two audits were considered particularly good and one audit was considered excellent.

B. Self-Assessment - the subcommittee reviewed the self-assessments for the last two quarters.

C. Corrective Action Program (CAP) - the CAP appeared sound and appropriate, especially with updates being implemented to improve trend analysis.

D. Subcommittee Summary - The subcommittee believed and recommended that self-assessment, corrective action, management observations, Event Trend Records (ETR) trends, and human performance be considered as an integrated whole. (The DCISC believed this subcommittee action was well-researched and a good model for other NSOC actions.)

## 5. NSOC Summary Reports

A. Plant Performance Indicators - plant performance indicators were presented. NRC indicators were all green. The human performance trend was flat and barely making INPO top quartile. Event-free days were at 33, below the goal of 60 days. An outside Member stated that the plant needed to lower human errors through trending, cause-code analysis and benchmarking.

B. Plant Staff Review Committee Summary - there was nothing significant to report.

C. Safety Evaluations - there were no significant problems. Safety evaluation reviews indicated that the quality of some Licensing Basis Impact Evaluations (LBIEs) had degraded in that they needed amplifying/clarifying comments as a basis for answers.

6. License Amendment Request - a request was presented for the elimination of the Post-Accident Sample System (PASS). NSOC approved the request.

7. Synergy Survey Results - results of the 2000 Synergy Comprehensive Cultural Assessment were presented. (Volume II, Exhibit D.7)

8. Integrated Assessment Report - the Vice-President & Manager of DCPD presented the results of the Integrated Assessment Report. Key performance areas were as follows:

- Human performance error rate had increased
- Personal safety practices had improved
- Equipment failures had increased
- Plant standards and management expectations had not been consistently met or enforced

NSOC Members asked questions for clarification and provided helpful suggestions about methods to improve and about other plants which have good programs.

9. Human Performance - The Station Manager provided an update on human performance. Based on analysis of error causes, the Human Performance Steering Committee (HPSC) believed that there were three key behaviors, which would have prevented many human errors at DCPD. These were (1) 3-way communication, (2) effective tailboards, and (3) self-

verification. This was substantiated by INPO.

Human performance error rate showed improvement in early 2000 but has degraded beginning in third quarter 2000. There have been four recent Event-Free Day "clock resets" due to a more frequent error rate. Lack of proper self-verification has been the primary cause of human error.

A self-assessment was conducted in March 2001 with an interdisciplinary team and an industry expert.

The HPSC established a one-year plan with the following aspects:

- Augmented human performance training for Operations, Maintenance, Radiation Protection and Engineering
- Goal-setting
- Self-assessment
- Communications
- Observations
- Rewards for successful Event-Free Days

NSOC agreed that these were the correct actions, and they were high priority.

10. 2R10 Outage Plans - The Station Manager presented DCP's plans for Outage 2R10, which had just begun. The motto for the outage was "Rising Above the Sea of Uncertainty". High-level goals for the outage were as follows:

- ALARA Goal - 109 person-Rem
- Safety Goal - no disabling injuries
- Duration Goal - 25 days, 19 hours
- Cost Goal - \$29.1 million

There were no significant NSOC questions or comments.

The DCISC observed discussion around each agenda item. Much of it appeared to be questioning for information/education and helpful suggestions for benchmarking or improvement. With few exceptions from one outside Member, there was little in the way of challenges to current thinking and processes. This could have been due to the newness of two outside Members. An example of good investigation, analysis and expectation by NSOC was the new Corrective Action Oversight and Assessment Subcommittee. The DCISC will continue to follow NSOC activities and monitor the planned changes over the next year.

The DCISC believes both internal and external Nuclear Safety Oversight Committee members should express higher expectations of DCPD and take a more aggressive stance in challenging problem solving and the status quo.

#### **Results of INPO Evaluation**

PG&E reviewed the results of the 2001 INPO evaluation with the DCISC. This was the eighth INPO evaluation of DCPD. DCISC has reviewed these evaluations at previous fact-finding meetings. INPO identified 10 strengths and 11 areas for improvement, with no repeat areas for improvement. The two most significant areas for improvement were discussed.

DCPD had performed a pre INPO self-assessment and identified most of the same areas for improvement. They let INPO review this self-assessment.

INPO also reviewed 6 operator-training programs for accreditation. PG&E will meet with INPO accreditation board in June, 2001 to get the results of these programs. INPO will review the other 6 training programs with the next DCPD evaluation.

The detailed results of the INPO evaluation were presented but are not included in this report as they are proprietary between INPO and PG&E.

The results of the recent INPO evaluation of DCPD appear to be favorable as DCPD continues to receive good reports from INPO.

#### **Integrated Assessment Process Overview and Update**

DCISC reviewed the Integrated Assessment Process (IAP) at the September 2000 Public Meeting (Volume II, Sec. B.3) and received an update on the program at the June 2001 Public Meeting (Volume II, Sec. B.9).

PG&E stated that the purpose of the Integrated Assessment Process (IAP) is to use information obtained from various performance assessments to facilitate the early identification of declining or marginal performance. The IAP facilitates communication to senior management and Plant staff of those recommendations which are made to enhance performance and it provides a means to evaluate DCPD performance against NRC criteria. The IAP does tend to focus on areas needing



improvement, rather than those demonstrating identified strengths. The IAP utilizes data from; 1) NQS Quality Performance Assessment Report (QPAR), 2) Line Self-Assessments, 3) NRC Performance Indicators, 4) NRC Inspection findings, 5) Assessment of NRC violations, and 6) Significance Determination Evaluation.

PG&E reported on the results of the 1st Quarter 2001 IAP report. Key Performance Issues were:

1. Human Performance:

- . Error rate is above historical levels.
- . DCPD has an 18-month plan to improve human performance that was completed in 4<sup>th</sup> Qtr. 2001.
- . The plan includes establishment of HPSC, implementation of three phase training program, development of accountability model, and implementation of communications plan for human performance issues.
- . DCPD has completed phase I & II Human Performance training for all departments including Engineering.
- . There was a 40% reduction Human Performance errors in outage form 1R10 to 2R10, which included the lowest outage error rate ever.
- . There was 1 human error in 2R10. The best before was 3 in an outage.
- . Maintenance has gone 3 successive outages without a significant human error.
- . Accountability model is fully implemented.

2. Personnel Safety Practices:

- . Personnel are not consistently adhering to personnel safety practices.
- . Resolution requires overall improvements in safety culture and associated behaviors.
- . Actions include leadership team heightened awareness and field observations, periodic communications of safety issues/successes, and implementation of new program with fewer and clearer requirements.
- . Based on the STARS Round-Robin Industrial Safety Self-Assessment, DCPD has taken action to make improvements in the safety program.

3. Equipment Failures:

- . A number of equipment failures in the last

two years have resulted in lengthy forced or extended refueling outages.

- Engineering Services and Maintenance Services sponsoring the Generation Vulnerability Identification (GVIT) to help resolve this issue.
- GVIT chartered to develop a process that integrates into existing processes to minimize/prevent unplanned capacity loss.

3. Management Expectations:

- Plant standards/management expectations are not being consistently met nor evaluated/reinforced.
- A focus area of the cultural work in 2001 will be to improve reinforcement of management expectations.
- 3 Qtr. 2001 training session for all supervisors will be held regarding how to set and monitor expectations, and dealing with conflict.

Areas being monitored that are of lesser significance are; 1) trending of low level errors, 2) ERO drill/exercise performance, 3) Maintenance training, 4) high radiation area violations, and 5) pre-outage milestones. The IAR report also listed five positive performance areas. These were; 1) CAP effectiveness, 2) operations and control room formality, 3) Management communications to employees and external entities during ongoing financial/energy crisis, 4) Procurement Group interaction with suppliers during financial crisis, and 5) plant housekeeping and overall material condition.

It appears that the Integrated Assessment Report is a positive tool for management's use to assess the overall performance of the plant. It combines all of the information from the various reports on the plant performance into one very useful document.

4.11.3 Conclusions and Recommendations

Nuclear safety oversight and review functions and organizations appear to be functioning satisfactorily at DCP. It also appears to be very beneficial to have the joint PNAC/NSOC meetings, since each committee covers much of the same agenda. The results of the 2001 INPO evaluation appear to

be favorable. The DCISC will continue to monitor the PNAC and NSOC meetings to observe their review of plant safety issues.

The DCISC observed that although there was constructive and helpful dialogue during the NSOC meetings, there were limited challenges to existing thinking and processes.

R01-4        It is recommended that PG&E management raise its expectations of the Nuclear Safety Oversight Committee internal and external members to take a more aggressive stance in challenging problem solving and the status quo. Additionally, PG&E should consider adding independent external members (not just from STARS plants).

It appears that the Integrated Assessment Report is a positive tool for management's use to assess the overall performance of the plant. It combines all of the information from the various reports on the plant performance into one very useful document. The DCISC will continue to review the Integrated Assessment Report.

## 4.12 Outage Management

### 4.12.1 Overview and Previous Activities

The DCISC monitors PG&E's outage plans, actions, and results in the following ways:

- Regular fact-finding meetings to discuss planned major modifications, inspections, maintenance and activities
- Regular reports from PG&E at DCISC Public Meetings on outage plans and outage performance, noting any special situations or problems affecting safety
- Visits to DCPD during outages to monitor the Outage Coordination Center, Control Room and activities of interest
- Reviews of documentation and reports of outage activities such as steam generator tube inspections, major equipment problems, overtime usage, and events affecting safety

PG&E completed its ninth Unit 2 refueling outage. Outage management performance has steadily improved since the DCISC began review in 1990. Outage length, typically over one hundred days initially, had plateaued in the high fifty-day range through 1R6. Outage 2R6 dropped to 34 days, 1R7 up to 57 days (with outage complications), 2R7 was 48 days, 1R8 at 44 days, 2R8 at 42 days, 1R9 at 35 days and finally 2R9 at 31.7 days. PG&E expects its outages can routinely run in the high-twenty to low-thirty day range.

Other outage indicators also are showing continuous improvement. With exception of anomalous 1R9 radiation levels, radiation exposure and personnel injuries have been steadily declining in the last three outages as follows:

	<u>Radiation Exposure</u> <u>(person-Rem)</u>		<u>Personnel Safety</u> <u>(recordable injuries)</u>		<u>Solid Radwaste</u> <u>(cu.ft./lbs.)</u>	
	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 1</u>	<u>Unit 2</u>	<u>Unit 1</u>	<u>Unit 2</u>
Outage						
R7	275	149	8	5	1032	893
R8	192	145	9	4	41099*	44323*
R9	314**	120	3	4	38945	34564
R10	162	108	2	1	48485	38171

\* This measure was changed to pounds in 1R8.

\*\* Radiation exposure for 1R9 is discussed below.

## **Hot Mid-Loop (HML) Operations**

Hot mid-loop operation is one of the most significant operations during the outage because it increases the potential for fuel damage in the shutdown mode. This higher risk configuration is necessary to maintain a short outage while performing increased steam generator maintenance and inspection. PG&E has been looking at options to reduce the risk during hot mid-loop operation. The risk assessment program ORAM is used to help control the risk during outages. Hot mid-loop operation was used in the 2R8 outage.

The DCISC reviewed the increased risk resulting from HML operation. PG&E had performed calculations and prepared graphs of Reactor Coolant System (RCS) boiling risk as a function of time for the steps leading up to, during and following HML operation. The average boiling risk for HML operation,  $1.81 \times 10^{-6}$  per hour, was 14% higher than that without HML operation,  $1.56 \times 10^{-6}$  per hour. The DCISC found the increased risk acceptable, considering the preparation, planning, training, and contingency analysis performed by PG&E.

**PG&E had exhibited effective outage management, including hot mid-loop operations, during previous reporting periods.**

## **Outage 1R9 Radiation Exposures**

DCPP experienced much higher than normal radiation levels during Outage 1R9. DCPP encountered a significant problem in outage 1R9 where it experienced unusually high radiation dose rates from the Reactor Coolant System and Residual Heat Removal System. The root cause of the high dose rates was believed to be plant chemistry and a December 1998 plant trip. Appropriate corrective actions were being taken to improve RP performance and practices.

**The DCISC has concluded in previous periods that PG&E has effectively managed its refueling outages.**

### **4.12.2 Current Period Activities**

There were two outages performed during this reporting period (1R10 in October 2000 & 2R10 in May 2001).

Outage 1R10 - October 2000. DCISC reviewed the plans, observed the outage and had presentations of the results of the outage

at three Fact-Finding Meetings (Volume II, Exhibits D.2, D.3, & D.6) and PG&E made presentations at two Public Meetings September, 2000 and February, 2001 (Volume II, Exhibits B.3 & B.6).

The DCISC observed many of the outage events during the October 25 & 26, 2000 Fact-Finding Meeting. They attended the daily outage meeting for outage 1R9. This was the 17<sup>th</sup> day of the outage. Overall progress to date was reported and the outage was about two days behind schedule. Radiation exposure to date was 104.3 person-Rem, compared to an estimated 119.9 person-Rem. There had been two recordable injuries to date, neither of which was rated as serious. There had been three reportable events in contrast to the Outage Safety Plan goal of zero. The schedule for the remaining outage activities was distributed and reviewed.

The 1R10 Daily Outage Meeting appeared appropriate for tracking outage activities, planning, and coordination, as well as maintaining system status to protect personnel and nuclear safety

The DCISC Team observed activities in the Outage Work Control Center (OWCC). Operations had formed "super crews" to handle work control during the outage. Super crews consisted of two twelve-hour shifts comprised of operators who were not involved in running either unit during the outage. They primarily coordinated clearances, one of the more important operations-related functions at the plant, and assisted Operations with outage-related duties.

The Outage Safety Plan was reviewed. The DCISC has reviewed the Plan in the past and found it to be a good tool for safety awareness and guidance for maintaining plant safety status in conjunction with the defense-in-depth approach to nuclear safety. The Plan summarized the outage scope and goals, RCS inventory control and contingency plans. The Plan appeared comprehensive and on-target. In the outage coordination room there was a useful chart on the wall showing Reactor Vessel and Cavity water level and heat removal modes during various plant states and operational activities. The DCISC believes this chart helps keep personnel aware of the conditions that apply during each mode.

Hot mid-loop operation was the most successful to date. It was performed in the shortest time on record at Diablo Canyon, and with no challenges.

The main turbine work carried out in Outage 1R10 was also reviewed. The plant had performed an inspection of No. 3 Low Pressure Turbine and replaced the rotor with a refurbished spare as it normally does each outage. The inspection revealed that part of a blade and part of the connected shroud had been lost. The rotor will be repaired prior to the next outage. High cycle fatigue was believed to be the cause. A tour of the Unit 1 turbine area was performed.

The DCISC Team also performed a tour of the Unit 1 Containment. The group observed fuel movement, installation of the new sump debris racks, radiation protection activities, and other miscellaneous activities. The refueling equipment appeared to work well.

Radiation protection practices inside containment appeared appropriate, although there seemed to be more personnel in containment than necessary. Upon exiting the containment, the group was effectively processed by Radiation Protection personnel.

**Except for three reportable events, the 1R10 outage was being performed safely in accordance with plans and goals.**

Outage 1R10 RP Results - the Director, Radiation Protection, presented a summary of performance of the Radiation Protection Dept. during 1R10 at the November 2000 Fact-Finding Meeting. The official exposure for 1R10 was 162.5 person-Rem which made 1R10 the lowest dose outage in unit one's outage history. Unit one outages have generally seen a radiation dosage in the range of 200 to 300 person-Rem (1R9 had an official exposure of 314 person-Rem). Much of the reduced dose was due to good shutdown chemistry control and zinc injection over the last two years.

There were 77 personnel contamination incidents for exposure of both clothing and skin, which PG&E stated was a good performance. The Director discussed examples where their observations have identified potential improvements to reduce the number of radiation contaminations. One example involves the shoe covers that are use at Diablo Canyon. There are new designs that are easier to wear and avoid some repeating contamination problems.

The DCISC reviewed the NRC License Event Reports (LERs) from outage 1R10. There were a total of eight LERs for the outage.

Four were caused by personnel error, and the remaining by equipment failure (3) and poor contractor culture (1). None of the errors were considered system-induced. PG&E determined that the majority of these errors were preventable through the use of good self-verification, concurrent independent verification, and the practice of STAR (Stop, Think, Act, & Review).

DCPP appeared to take a reasonable approach to the analysis of causes of reportable events during Outage 1R10. The predominant cause was human error, and they are taking additional steps to improve human performance with new programs and organization and training focused more on human behavior.

Overall, with the exception of meeting the schedule, it appears that 1R10 was a very successful outage from personnel and nuclear safety and cost.

Outage 2R10 - May 2001. DCISC reviewed the plans and had presentation of the results of the outage at one Fact-Finding Meeting (Volume II, Exhibits D.8) and PG&E made presentations at two Public Meetings in February 2001 and June 2001 (Volume II, Exhibits B.6 & B.9).

#### Radiation Protection (RP) Planning for Outage 2R10

The DCISC Team discussed RP plans for Outage 2R10 with the DCPP Manager of RP. In addition to the normal plans, there were the following changes:

- Simplified Radiological Posting - previous signs identifying High Radiation Areas (HRAs) were too confusing because the layout was not standardized and contained many different instructions and labels. The revised signage consisted of three easy-to-comprehend pieces of information, always in the same order. Each of the labels is color-coded for quick identification and understanding.
- Work briefings moved outside of Containment - previous in-Containment briefings were adding to doses, and moving them to low-dose areas will help to lower doses.
- Hot Particle Control emphasis changed - the previous high emphasis on Hot Particle Control was changed to overall Contamination Control, which includes all radioactive



contamination.

- Improvements in protective clothing footwear - a change from the integral nylon/rubber bootie to a separate nylon bootie and rubber overshoe will be safer on slippery surfaces and will help reduce contaminations.

In addition to the normal radiation protection planning for Outage 2R10, DCPD has made what appear to be simple, logical and effective changes to radiological postings, lower-dose work planning locations, contamination control, and protective clothing.

#### Plans for Refueling Outage 2R10 and Safety Plans

PG&E presented the plans for 2R10 refueling outage with the safety plans at the February 2001 Public Meeting (Volume II, Exhibit B.6). The major maintenance scope of the outage include: refueling and fuel repair, steam generator maintenance, main turbine generator maintenance, 4 kv and 480 v bus H maintenance, valve maintenance and surveillance testing. Chemistry indications of fuel damage have been found for unit 2 which may involve one open rod on one fuel assembly and consequently, PG&E will be doing in-mast sipping of the fuel assemblies removed to locate any fuel damage. They will have contingency plans in place to deal with any damaged fuel discovered once it is in the spent fuel pool.

The major projects identified for 2R10 include:

- Main feedwater piping replacement
- Containment Recirculating Sump Screen modifications
- Reactor Coolant Pump Motor cable replacement
- Main Generator Current Transformer dismounting
- Reactor Vessel Refueling Level Indication System upgrade
- Reactor Coolant System Vacuum Refill System

Personnel goals for 2R10 include achieving an exposure goal of  $\leq 109$  person-Rem with no personnel safety incidents, errors or disabling or reportable injuries. Nuclear safety goals include no loss of core cooling with the core in any location, event-free mid-loop operations and no equipment damage.

The budget for outage duration and cost is for a 35-day outage at a direct cost of \$31 million, the goal is for a 30-day outage at a direct cost of \$30 million. The plan is to achieve

the outage in 26-27 days at a direct cost of no more than \$28 million. PG&E reviewed the schedule for 2R10 major milestones in outage preplanning including work order preparation, issuance of the Rev. 0 Schedule, completion and issuance of work instructions.

The Outage Safety Plan would be very similar to that for 1R10. There have been no unusual activities or risks identified and the overall risk will be about the same as recent DCPD outages. The higher risk evolutions will be the two mid-loop operations, before core offload and following core reload.

PG&E presented the focus areas for improvement during 2R10 including expanded use of pre-outage milestones, top priorities for safety and quality and attention to human performance fundamentals through use of tailboards briefings, self-verification and use of three-way communications. PG&E is also working to improve the Lessons Learned Program to encourage personnel to make immediate comment and offer suggestions to the Program in a timely fashion so they may be evaluated and if appropriate, incorporated and implemented during the next refueling outage.

#### Results of 2R10

PG&E presented the results of 2R10 at the June 2001 Public Meeting (Volume II, Exhibit B.9). 2R10 was one of DCPD's best outages from nuclear and personnel safety and schedule standpoints. In the area of personnel safety, they had no disabling injuries (DI) and only one recordable injury (RI) vs. no DI and 4 RI at previous best outage. The exposure was 107.6 person Rem vs. 120.4 person Rem at previous best outage and a 2R10 goal of 109 person Rem. There was one human performance significant event vs. two in the previous best outage and 26 security events vs. 24 in the previous best outage. The outage was 29 days and 11 hours vs. 31 days and 18 hours in the previous best outage resulting in a cost of \$30 million vs. \$25.5 million for the previous best outage.

The human performance significant event was the start up feeder breaker inadvertently left in "Test" position during performance of STP. The schedule was delayed 3 days and 16 hours because of generator core tightening/inspection. All the major routine scope work was completed as well as the major project scope work. Significant emergent scope included 1) generator through bolt/building bolt torque and 2) CRDM canopy seal weld repair (Volume II, Exhibit B.9). Areas identified

for improvement included 1) Pre-Outage Planning and Preparation, 2) Schedule Adherence and 3) cost Forecasting and Control.

Excellent shutdown chemistry was one of the reasons the dose of 107.6 person Rem was the lowest for any outage. The posting program was changed and there were no high radiation area boundary violations. DCPD instituted new RCA turnstiles before the outage and had no RCA entries without functional electronic dosimeter. New steam generator protective clothing improved preparation time and mobility. The overall results were; 1) lowest steam generator bowl dose rates ever, 2) low dose for steam generator work, 3) low dose for outage and 4) good success with RHR system flushes.

It appeared that PG&E managed the 2R10 outage very effectively to achieve the best outage at DCPD in all measures except cost. DCISC will continue to review the performance of each refueling outage.

#### 4.12.3 Conclusions

It appears that PG&E managed the 1R10 and 2R10 outages very effectively to achieve the best outages at DCPD in all measures except cost and schedule. DCISC will continue to review the performance of each refueling outage.

#### 4.13 Overtime Control

##### 4.13.1 Overview and Previous Activities

The DCISC has been following overtime control at DCPD for a number of years. There had been problems with personnel exceeding plant overtime guidance and requirements; however, it appears PG&E has solved overtime problems and has good controls in-place. The DCISC will continue to monitor overtime performance but not report it separately, unless problems occur, such as that described below.

In its Inspection Report 50-275/323/00-05 the NRC identified a non-cited violation for failure of Maintenance management to review monthly overtime reports. Because of the difficulties in obtaining overtime records and the number of errors observed with the records, the NRC inspectors concluded that inadequate controls existed in the Maintenance organization for routine oversight of overtime usage. Several Maintenance craftsmen exceeded Technical Specifications (TS) limits for overtime usage.

A DCPD Maintenance Services investigation showed that none of the 103 potential occurrences were actually unapproved TS overtime exceedences, but a number of record-keeping errors were identified, and Maintenance Services had not performed the required monthly reviews. The problem was put into the Corrective Action Program for correction.

NQS also performed an audit of personnel errors during the time frame of the potential overtime exceedences. No cases were found where overtime contributed to personnel error. A NQS review of Operations overtime records found that review and approval requirements were being met.

It appears that the failure of management to perform Technical Specification required monthly review of overtime reports was isolated to Maintenance Services, and there were no unapproved no unapproved overtime exceedences; however, there were a number of errors in overtime records.

##### 4.13.2 Current Period Activities

Based on satisfactory overtime controls and performance, the DCISC did not perform a review of overtime during the current reporting period. The DCISC will continue

to monitor overtime usage and indications of problems.

#### 4.13.3 Conclusions

Although no specific reviews were made of DCPD overtime activities, there did not appear to be any problems. The DCISC will remain sensitive to overtime problems.

#### 4.14 Quality Programs

##### 4.14.1 Overview and Previous Activities

The DCISC has followed PG&E's quality programs continuously since 1990. The DCISC has looked at the following aspects of the quality programs in fact-finding meetings and public meetings in previous periods:

- Overview of Quality at Diablo Canyon - PG&E has made presentations at DCISC public meetings on the quality program at DCPD.
- Effectiveness of QPARs as a Source of Tracking Broken Barriers to Unsafe Operation - NQS is responsible for the collection of long-term data and issuance on a quarterly basis as the Quality Performance Assessment Report (QPAR). The report provides input on broken barriers to unsafe operation, cause of barrier failure and trend data. The DCISC receives this report quarterly.
- Utility Review of PG&E QA/QC Departments Audits - the PNAC requires an independent assessment be made of QA/QC annually. PG&E previously used the JUMA Audits to satisfy this requirement. The Region IV Utilities that participated in the JUMA Audits agreed to disband the current JUMA process and support the Independent Audit/Review by resource sharing on a given topical area. The DCISC regularly reviews these audits.
- NPG Quality Plans - The Quality Plans, which are owned by each department manager, are designed to provide early detection of quality problems for the purpose of keeping the organization focused on the quality of their products. The DCISC regularly reviews these plans.
- Quality Assurance (QA) Self-Assessments - PG&E has made technical presentations at DCISC fact-finding meetings and public meetings to review their QA Self Assessments.
- Quality Problems - DCPD has made significant progress in reducing the backlog of Quality Problems.
- Operating Experience Activities - In the area of Operating Experience Activities (OEA), NQS has reduced the backlog. The DCISC periodically reviews the OEA function.

NQS has established an Audit Review Board (ARB) whose objectives are: 1) foster a strong, effective and efficient QA function, 2) ensure a consistent and aggressive critical evaluation of plant programs, performance, and material condition, and 3) serve as a forum for early identification and resolution of conditions that may impede the conduct of audits. NQS looks at the year-end QPAR on how each department is doing for the year to give an overall assessment of yearly performance.

**In previous periods the DCISC has found that the quality assurance function appeared effective.**

#### **4.14.2 Current Period Activities**

During the current period, the DCISC had DCPD NQS presentations on Quality Programs at three Public Meeting (Volume II, Exhibits B.3, B.6 & B.9) and three Fact-Finding Meetings (Volume II, Exhibits D.2, D.5, & D.7).

#### **Meeting with Manager of Nuclear Quality and Licensing**

The DCIS met with the Manager of Nuclear Quality and Licensing (NQAL) at the October, 2000 Fact-Finding Meeting (Volume II, Exhibit D.2). He described the recent changes which brought Nuclear Safety and Licensing (NSAL) and Nuclear Quality Services (NQS) together into one organization, NQAL. Included in the organization are the Corrective Action Program, Transient Analysis, and Probabilistic Risk Assessment. DCPD management believes these related functions will work most effectively and efficiently together. The transition to the Improved Technical Specifications, specifically the preparation, training and support provided to Operations was also described. He believed that the transition had been accomplished successfully with few problems.

#### **Top Ten Quality Problems**

The DCPD NQS Supervisor discussed the NQS Quality Problem Action List for Aging Quality Problems at the December, 2000 Fact-Finding Meeting (Volume II, Exhibit D.5). The list contains Nonconformance Reports (NCR), Quality Evaluations (QE), and "A" Type Action Requests. The list identifies the oldest quality problems in each of the QP reporting methods. Quality problems on the list may not necessarily be old, but

may need attention by the line organization. He also reviewed three NCRs and two QEs, which they felt, were the most important quality problems.

The Corrective Action Program (CAP)/Human Performance (HP) programmatic upgrade action plan (current - 3 year plan) was also discussed. This included; 1) Cause analysis process improvements, 2) ETR process improvements, 3) Generic CAP improvements, and 4) Human Performance improvements.

It appears that the NQS group is doing a good job in monitoring the top quality problems and bringing them to the attention of line management.

#### **Update on Self-Assessments**

DCISC reviewed the self-assessment program at two Fact-Finding Meetings (Volume II, Exhibits D.5 & D.7) and at one Public Meeting (Volume II, Exhibit B.3).

The current Self-Assessment Program was started at DCPD in late 1999. The program structure included a defined owner, a program guide, management oversight, and designated department self-assessment coordinators. PG&E stated that the program is doing very well, but still can be improved. The program should reach maturity by the end of 2001. The managers are continually encouraged to improve on their self-assessments. DCPD performed 55 self-assessments during 2000. They have set a goal of about 40 self-assessments per year by the line organizations and have met or exceeded these goals. Overall, they have produced a large number of quality reports.

DCPD has generated 15 reports in the first quarter of 2001, but the quality of some of the reports has declined. Critiques are performed for every assessment and the results provided back to the team leader and the Self-Assessment Advisory Board. The critiques provide a performance measurement for the team leaders and may lead to continual improvement in report quality, schedule adherence, and team composition. They are working with other STARS plants on self-assessments to perform round-robin assessments between plants and share resources.

DCPD now has a new grading process for self-assessments, which they believe, will improve the quality of the self-assessments. They have established a core group of 12-14 employees that meet monthly to review the reports. They reported that Operations continues to do self-assessments very



well and Engineering has improved on theirs. They still need self-assessments to address generic items. Each self-assessment report result goes into the corrective action program. DCPD plans on performing some self-assessments during 2R10.

It appears that DCPD has the self-assessment program well under way and are producing about the desired number of assessments. They are also taking action to improve the quality of the assessments, including the reports. They expect to have the program fully implemented by the end of 2001. It is recommended that DCISC continue to review the program and some of the self-assessment reports at a fact-finding meeting in the 2nd Quarter 2002.

#### **Security Response/Reaction to QA Security Audit**

The Security Services Manager, reviewed with the DCISC Team the Security response to the NQS audit of Security at the April, 2001 Fact-Finding Meeting (Volume II, Sec. D.7).

The NQS audit recommends that Security use the Plant Quality Program to identify and correct problems.

Security has agreed to the following changes: 1) Security will now write Action Requests (ARs) on all equipment problems and use a trending program and 2) Security will set certain threshold levels for which they will write ARs, but will not write them for every logged event. Security will also do trending on all the logged events.

NQS also recommended that Security eliminate the Security Review Group process and utilize plant Corrective Action Program with NCRs and QEs as applicable. Security is working with NQS on this matter, but had not agreed to it at this time.

The Security Manager also discussed NRC developments in the Security Area. The Utility Security Working Group is working with NEI to resolve these issues with the NRC.

It appears that Security has been responsive to most of NQS's recommendations from the audit and working with NQS to settle the final remaining issue. The DCISC will follow up on these issues at a future Fact-Finding Meeting.

## **Nuclear Quality Services (NQS) - Status of Improvements from last Biennial Audit and NQS Self-Assessment**

The Manager - NQS Eng/Proc/Maint presented the status of improvements from the 1999 NQS Biennial Audit and the results of the 2000/2001 NQS Self-Assessment at the April, 2001 Fact-Finding Meeting (Volume II, Sec. D.7). Every two years, NQS performs a Self-Assessment of key NQS activities.

The corrective action for the three audit findings and the ten recommendations from the 1999 NQS Biennial Audit have been completed.

The 2000 self-assessment was started in December, 2000 and completed in April, 2001. The scope of the Self-Assessment included Internal Audit Performance, Personnel Qualifications, and QA Program.

The summary of the preliminary report results were: 1) Internal audit process and implementation meet and in some cases exceed Regulatory Requirements, and overall performance is rated as good and very effective and 2) oversight qualifications meet requirements.

There were three findings, nine recommendations, and four strengths included in the report. NQS stated that the three findings were not significant ones. The report also noted that 1) audits were probing, performance-based, technically oriented, and monitored significant emergent issues and program changes, 2) audits contributed to plant performance by identifying significant issues and improved the performance of audited organizations, and 3) audit scopes were comprehensive and covered the appropriate regulatory requirements.

The role of the NSOC in selecting the scope of the NQS independent audit was also discussed. NSOC reviews the scope of these audits after NQS determines the scope, but has had little input into the process. The DCISC stated that they thought that NSOC should take a more active role in determining the scope of the biennial audit of NQS to give the audit more independence.

It appears that NQS is performing Self-Assessments in a timely manner and the scope of the audits seems to be satisfactory.

The DCISC believes that NSOC should take a more active role in determining the scope of the biennial audit of NQS to give the

audit more independence. The DCISC had made a similar recommendation (Recommendation R00-10) in the previous Annual Report and requests that PG&E reconsider its response of having NSOC merely review the audit plan.

Recommendation Basis: NQS has the responsibility to determine the scope and areas to be inspected for the Biennial Audit/Self-Assessment. NSOC reviews and approves the scope of the audit but NQS reports that NSOC has not suggested any changes or additions to the audits. NQS also manages the Audit and obtain the necessary inspectors for the Audit. These Audits are performed for NSOC to determine the effectiveness of the QA Program. The DCISC believes that for the Audit to be independent, NSOC should specifically input on and review and comment on what areas they think should be audited.

#### **Nuclear Quality Services (NQS) Review of year 2000**

PG&E reviewed and discussed the Quality Performance Assessments Reports (QPARs) issued during the year 2000 at the February, 2001 Public Meeting (Volume II, Exhibit B.6).

PG&E stated that the identified strengths and positive observations in the QPARs were the increased focus on radiation protection practices, which contributed to the lowest accumulated dose during 1R10 for a unit 1 outage, the lowest number of personnel contamination incidents ever at DCPD and the lowest non-surface contamination area personnel contamination incidents for a non outage period at DCPD. The QPARs indicate that the DCPD organization responded well to plant transients, curtailments and shutdowns during 2000, and improvement was noted in the quality and use of self-assessments performed.

Implementation of the Improved Technical Specifications was judged to have been well coordinated and peer certification of the Probabilistic Risk Assessment (PRA) Program ranked that program as the best observed among ten similar plants. PG&E stated that conservative decision-making, good use of self-assessment and innovation in design were characteristics of noteworthy performance by the Engineering Services organization during 2000. Increased focus and management support of Human Performance as evidenced by formation of a Human Performance Steering Committee (HPSC) and subcommittee in Operations, Maintenance, and Engineering were identified as strengths. One licensed operator training class was conducted

and all candidates passed their NRC exams.

The 2000 QPARs identified certain areas for improvement including a number of equipment related problems, which highlight a need for a comprehensive program to address age-related degradation of DCPD equipment. Use of Event Trend Records (ETRs) has had limited success in identifying adverse trends although that Program continues to show improvement. There are, however, some organizations, which do not use the Program effectively. The QPARs identified less than effective use of the Operator Walkaround/Burden List and an increase in the numbers of Control Board Action Requests (ARs). PG&E stated that the QPARs and NQS assessments have identified many of the same issues and, together with Self-Assessments and the NRC PIs, they are used by PG&E to produce the Comprehensive Integrated Assessment Report for DCPD.

It appears that using the QPARs is a good method for DCPD management to identify the overall performance of DCPD for the year. The QPARs identify the adverse trends, the areas that need improvement, and the areas that are performing well. DCISC receives the QPARs, which are issued quarterly. DCISC will continue to request NQS to review QPARs at fact-finding and public meetings.

#### 4.14.3 Conclusions and Recommendations

As in past years, the DCISC concludes that the quality program and self-assessment program have been effective in identifying strengths and weaknesses of the activities at DCPD and bringing about effective corrective action. It appears that the NQS group is doing a good job in monitoring the top quality problems and bringing them to the attention of line management. The DCISC will continue to review DCPD quality programs as part of its normal activities.

R01-5      It is recommended that NSOC take a more active role in determining the scope of the biennial audit of NQS to give the audit more independence. The DCISC had made a similar recommendation in the previous Annual Report and requests that PG&E reconsider its response of having NSOC only review the audit plan.

## 4.15 Radiation Protection

### 4.15.1 Overview and Previous Activities

DCPP Technical Specifications contain requirements, programs, and procedures to specify the details of their radiation protection programs. Although limits are specified, plant operators use the philosophy of As Low As Reasonably Achievable (ALARA) to maintain radiation exposures and releases as low as they can. DCPD has a formal ALARA program; the program applies to personnel exposure in the plant as well as normal releases to the environment. PG&E files reports semi-annually and annually regarding personnel exposures, releases outside DCPD and regular soil, vegetation, water and air samples taken around the plant.

The DCISC regularly monitors DCPD personnel exposure as one of its performance indicators. It also reviews any radiation protection events or incidents that are reported in LERs or NRC violations. The DCPD performance in radiation protection has been satisfactory, and there have been few problems; however, PG&E performance is not in the top quartile of the industry.

The major personnel exposure occurs during refueling outages when most of the work in the Radiation Control Area (RCA) is performed. DCPD sets outage and annual goals for exposure, and reports these at each DCISC public meeting. DCPD also submits a semi-annual report to NRC on any planned, normal radioactive releases from the plant; DCISC reviews this report. Any abnormal releases are reported in special reports, typically LERs, although there have been none since the DCISC began in 1990.

DCISC reviews in previous periods include the following:

- Radiation Protection Events
- Control of High Radiation Areas
- Respirator Issue Problems
- Control of Surface Contamination Areas
- Personnel Contamination Experience and Plans
- Radiation Protection Performance
- Overview of the Radwaste Systems
- Overview of Radiation Protection Program, including self-assessments and assessments by NQS, INPO and NRC.

- Outage 1R9 Radiation Protection - DCPD encountered a significant problem in outage 1R9 where it experienced unusually high radiation dose rates. This resulted in accumulated exposures of 314 person-Rem. The root cause of the high dose rates was believed to be plant chemistry and a December 1998 plant trip. Appropriate corrective actions were being taken to improve RP performance and practices.
- Radioactive Releases - Over the last five years, DCPD radioactive releases have been a small fraction of Technical Specification limits.
- Refueling Outage 2R9 Radiation Protection Results - the station successfully met its 2R9 120 person-Rem goal. Personnel contaminations were 128 compared to 209 in Outage 1R9 and a reduced number of radiological occurrence reports compared to recent outages.

**The DCISC has judged the DCPD radiation protection program effective in the past.**

#### 4.15.2 Current Period Activities

The DCISC regularly reviews DCPD radiation doses at its fact-finding and public meetings.

The five-year results through June, 2000 are as follows:

DCPD Radiation Doses (person-Rem)

<u>Year</u>	<u>Unit 1 Outage</u>	<u>Unit 2 Outage</u>	<u>Other</u>	<u>Total</u>
1997	193	-	26	219
1998	-	154	17	171
1999	314	120	19	453
2000	163	-	18	171
2001*	-	108	6	114

\* Through June, 2001

Through 1999 the best nuclear plants in the U.S. have doses below 80 person-Rem average per reactor per year for a rolling three-year average. The DCPD 2000 comparable was 267 person-Rem. For 1996, 1997, 1998 and 1999 the DCPD averages were 176, 114, 281 and 268 person-Rem, respectively.

## Management of Radiation Exposure During Recent Outages

The DCPD radiation dosage rate experienced during the 1R9 refueling outage resulted in a 314 person-Rem dose and exceeded by a considerable margin the dose goal set for 1R9 of 184 person-Rem. The DCISC reviewed RP plans for upcoming Outage 2R10 with the Radiation Protection Manager. In addition to the normal plans, there were the following changes:

- Simplified Radiological Posting - previous signs identifying High Radiation Areas (HRAs) were too confusing because the layout was not standardized and contained many different instructions and labels. The revised signage consisted of three easy-to-comprehend, color-coded pieces of information (contamination levels, airborne radiation levels, and radiation dose rates), always in the same order.
- Work briefings moved outside of Containment - previous in-Containment briefings were adding to doses, and moving them to low-dose areas will help to lower doses.
- Hot Particle Control emphasis changed - the previous high emphasis on Hot Particle Control was changed to overall Contamination Control, which includes all radioactive contamination.
- Improvements in protective clothing footwear - a change from the integral nylon/rubber bootie to a separate nylon bootie and rubber overshoe will be safer on slippery surfaces and will help reduce contaminations.

The goal for 1R10 was set at 147.5 person-Rem, to be achieved using shutdown techniques similar to those used during 2R9 with the addition of an RHR flush during startup. Other planned flushes included containment spray/RHR on the 115-foot level of containment and the RHR above the RHR sump.

The radiation dose for 1R10 was 162.5 Rem which made 1R10 the lowest dose outage in U-1's operational history. U-1 outages have generally seen a radiation dosage in the range 200-300 Rem for a typical outage. The duration of 1R10 was 40 days 10 hours and there were 77 personnel contamination incidents (PCI) for exposure of both clothing and skin, which Emergent work contributed 12.9 Rem and the extended duration of the outage added 1 Rem for a total additional dose of 13.9 Rem.

For outage 2R10 adjustments in the shutdown/RCS cleanup strategy were implemented to deal with a significant increase

in RCS contamination late in the operating cycle. As result, dose levels were reduced at many locations, including the lowest steam generator bowl dose rates in plant history. The overall exposure for 2R10 was 107.6 person-Rem. This represents a 10% reduction from DCP's previous lowest value of 120.4 person-Rem in 2R9.

### **Changes in Radiation Protection Management, Philosophy, and Organization**

The DCISC met with the new DCP Manager of Radiation Protection who came from another nuclear facility and possesses substantial radiation protection experience. He reported the following current organizational structure issues:

- Diffuse supervisory accountability - there were too many direct reports to some supervisors (e.g., the General Foreman)
- Rad Engineers (individual contributors) report directly to the Manager of RP
- Rad Engineers not organizationally tied to plant process teams and production goals
- High Impact Teams had been set up to follow processes but cross supervisory boundaries

These issues and loosely defined program roles were leading to overlaps and knowledge disconnects between personnel in field implementation.

Organizational structure goals include:

- Process-based organization aligned with Operations and Maintenance organizations
- Supervisory accountability for process ownership
- Clearly-defined, non-overlapping roles and responsibilities tied to Asset Teams such as
  - Radwaste/Decon
  - Maintenance Asset Team Support
  - Operations Support
  - RP Programs Support
- Improved RP planning, e.g., Maintenance planning model and a full-time outage RP planner to help reduce dependency on contractors.
- Implement new structure following Outage 2R10



The desired structure would include improved supervisory development with rotations into Quality Assurance (QA), Shift Technical Advisor (STA) rotation for Rad Engineers, possible RP Training rotation, and RP supervisor rotation. The improvements would also include a better performance evaluation system for individual contributor and supervisor advancement. DCPD planned to implement these changes following Outage 2R10.

### **Radiation Control Area Tour**

The DCISC toured portions of the DCPD Radiation Control Area (RCA) with the Radiation Protection Manager. The purpose of the tour was to observe existing and improved radiation area controls. The tour included the following areas:

- Steam Generator (SG) Outage Primary Telemetry & Remote Dose Monitoring Facility - a mobile office with equipment to remotely monitor SG inspection activities and related radiation fields.
- 140-foot elevation Unit 2 Containment RCA Access Control - main access control point for ingress and egress to the Containment.
- 85-foot elevation RCA Auxiliary Building Access Control Point - main access control point for ingress and egress to the Auxiliary building. The group was processed in and out of the RCA here, including logging into the RCA access control system, receiving RP instructions, receiving alarming dosimeters, and receiving hand and foot radiological screening upon exiting. DCPD had added dosimetry-system-controlled turnstiles to prevent personnel from entering the RCA without properly logging into the system.
- 85-foot elevation Unit 2 Containment Penetration Room
- Several equipment rooms

The DCISC observed numerous examples of the new radiological posting system, remote radiation monitoring and ALARA cold areas (low dose rate waiting areas). All aspects of RP controls observed in the RCA appeared satisfactory and effective. It appeared that effective use was being made of radiological posting, monitoring, and controls.

#### 4.15.3 Conclusion

The DCPD radiation protection program for controlling radiation doses inside and outside the plant appears effective overall. DCPD had experienced unusually high radiation dose rates during Outage 1R9 but had effectively reduced those levels in three subsequent outages. The DCISC will closely follow radiation protection during future outages.

#### 4.16 Risk Assessment and Management

##### 4.16.1 Overview and Previous Activities

PG&E has developed in-house capability to perform risk assessments. PG&E periodically updates its Probabilistic Risk Assessment (PRA) to incorporate changes in plant configuration and, if appropriate, operational changes. The PRA Group has been updating the original 1995 risk assessment which included the sum of internal, seismic, fire and shutdown risks. The 1995 core damage frequency (CDF) was  $1.12 \times 10^{-4}$  per year, and the revised risk is lower at  $9.72 \times 10^{-5}$  per year - a 13% decrease. Much of the reduction is due to implementation of the Maintenance Rule and resultant increased equipment reliability and PRA modeling improvements. The reduced overall risk permits more flexibility in scheduling on-line maintenance. The NRC criteria are based on a  $1.0 \times 10^{-6}$  per year risk threshold for on-line maintenance, and DCPD will have more room within that threshold to perform additional maintenance on line.

At PG&E, risk assessment has become an important tool in providing guidance to decision-makers and planners on how to best minimize the risk of plant operations. PG&E applications of PRA include, start up risk assessment, risk assessment of on-line maintenance, risk assessment of primary vessel pressurized thermal stress (PTS) and out-of-service risk assessments in support of the Maintenance Rule.

PG&E controls its risk from on-line maintenance procedurally. For On-Line Maintenance the PRA Group prepares a Risk Profile on a weekly, monthly and fuel cycle basis. The PRA Group works very closely with personnel performing the On-Line Maintenance risk assessment, and the program has been working very well.

The On-Line Maintenance (OLM) model has been used by Operations and Maintenance as an on-line planning tool for various operations and maintenance activities. DCPD is considering using ORAM Sentinel (Outage Risk and Management) instead of OLM. Using ORAM, the PRA Group has increased allowable outage times (AOTs) for the Auxiliary Feedwater Pump and identified more sources of water. Similarly, AOTs have been increased for the EDGs, startup power, and CCWPs. AOTs have decreased for the SI, Charging and RHR pumps and have decreased significantly for the SSPS, which represents the highest-risk AOT. The Group planned to develop a shutdown model in 2001.

The DCISC has found that the PG&E PRA performance appeared effective in previous reporting periods. The PRA Group continues to take a strong, effective role in plant risk-based decision making.

#### 4.16.2 Current Period Activities

The DCISC reviewed the following PRA items during the current reporting period:

##### **NRC Report on Refueling Outage Risk**

The DCISC Team reviewed a recent NRC report on outage safety (Volume II, Exhibit D.6, Section 3.3). The NRC report analyzed data from 19 refueling outages, including 16 pressurized water reactors (PWRs) and 3 boiling water reactors (BWRs). The PWR list included DCP-1 and -2. The purpose of the study was for NRC to gain an understanding of the overall risk of each refueling from two perspectives: plant configuration risk and modification impact risk.

The report showed the expected and actual total risk estimates for each outage and identified the peak risk per hour. The report identified major modifications and maintenance activities, which could significantly add to outage risk. Human errors and other operational issues contributing to risk were listed. The operational issues were of particular interest because they included events, which could cause loss of core cooling and potential core damage. The events included loss of offsite power, loss of shutdown cooling, inadvertent isolation of service water, improper alignment of spent fuel cooling, etc. The NRC looked specifically at mid-loop operations as a relatively high contributor to risk but also concluded that it received increased attention and awareness, which lessened its impact.

The NRC noted, as did the DCISC, that there was a wide range of risk values observed in the estimates of both the cumulative outage risk and peak risk. This was attributed to differences in modeling and other related data or analysis issues as opposed to actual differences in risk.

DCPP personnel were familiar with the study and had performed a full plant-specific, operational risk assessment as well as a generic industry modeling of shutdown risk. DCP has begun a

formal, comprehensive, plant-specific shutdown risk analysis, which it expects to complete in 2002. They currently estimate outage risk at about 10-20% of total plant risk. Upon completion of the full shutdown analysis, DCPD will be able to compare risks in it and the operational assessment to better determine when or whether to perform on-line maintenance.

#### **DCPD Probabilistic Risk Assessment (PRA) Program Update**

The DCISC reviewed the status of the DCPD PRA Program (Volume II, Exhibit D.7, Section 3.8). The PRA Group continues to progress in the new NRC risk informed era. The group presently has three full-time qualified engineers and a supervisor. Their routine support activities are model configuration control, risk assessments for Operations, the Maintenance Rule and for Engineering, and risk-informed applications for management.

Progress that has been made is as follows:

- Completion of the second plant model update in two years
- Successful Westinghouse Owners Group (WOG) peer certification
- Integrated model for seismic, fire and internal events including flooding
- High PRA Group scores on the Cultural Survey
- Submittal of RI-ISI (risk informed - in service inspection of piping) to the NRC in December 2000 and January 2001
- Development of a risk-ranking tool for reliability improvement projects
- Submittal of a PRA AOT (allowed outage time) for CCP 2-1 to the NRC, which has been approved
- Currently developing the next generation of ORAM-SENTINEL
- First plant to undertake NRC benchmarking on SDP (Significant Determination Process) Phase II

PG&E reported that, following its benchmarking, the NRC said that DCPD had one of the best PRA Groups in the industry. The DCPD PRA Group discontinued use of ALTRAN Corp., a PRA consultant, for support of PRA activities. They use PL&G, another PRA consultant, to assist with any questions involving the PRA model. Future plans call for evaluating the priority of the next PRA-AOT application for the second half of 2001 (diesel generators or one ECCS SSC). The development of a Shutdown & Transition model has been deferred to 2002.

It appears that DCPD has been successful in staffing and developing the PRA Group at the site. The PRA Group is also supportive of daily plant activities and has prepared themselves to work in the new NRC risk-informed era.

#### 4.16.3 Conclusions

Overall, PG&E's risk assessment and risk management programs appear to be effective in supporting safe plant operation. The PRA Group has become pro-active and effective in supporting station decisions with risk-based analyses. The DCISC will continue to review risk management activities as part of its normal activities.

#### 4.17 Safety Conscious Work Environment

##### 4.17.1 Overview and Previous Period Activities

The safety conscious work environment supports employees with such programs as the (non-confidential) Action Request (AR) problem-documentation process, and the Employee Concerns Program (ECP), whereby any employee may report a safety concern with anonymity and confidentiality, if desired and the non-confidential Differing Professional Opinion Program. There have been two major surveys, by the Martin-Sigmon organization (1997) and Synergy, Inc (September/October, 1998, November 1999 (mini-survey), and November 2000). Their findings and recommendations, discussed below, were accepted and implemented.

- In April 1996, a PG&E Operations shift foreman contacted a member of the DCISC about a number of safety-related concerns, already raised with PG&E. After several discussions with the employee, and a review of PG&E's investigations, the DCISC determined that PG&E had performed a satisfactory investigation.
- PG&E engaged Martin-Sigmon Consulting Services in February 1997 to conduct an independent assessment of PG&E's Employee Concerns Program (ECP) and the safety culture in Nuclear Power Generation (NPG).
- The number of concerns raised by employees with the ECP remained fairly constant in 1997 (36) and 1998 (37). The number of NRC allegations also remained consistent: 1996 had 21, 1997 had 18, and 1998 had 22. In 1999, there was a significant decrease in both DCPD (13) and NRC (3) referrals. NRC referred one concern back to DCPD to investigate. None of these concerns raised significant safety issues.
- Synergy, Inc assessed the plant's safety culture in September and October 1998. It concluded that the nuclear safety culture at DCPD is adequate-to-good, and that DCPD personnel are very willing to identify potential nuclear safety issues and concern.
- Synergy recommended specific actions by management for further improvement of the safety culture, as follows: Employee trust and confidence in management appeared to be generally lower than desired site-wide, with employees

perceiving a lack of openness by DCPD management to input from the workforce. Some personnel perceived a chilling effect due to the relief from duty of the concerned Operations shift foreman. Employees were also concerned about future decisions regarding continued operation of DCPD. Synergy suggested specific actions to improve trust in management, management and supervisory practices, new leadership in operations and in maintenance, and the establishment of a 5-year business plan.

- The results of the 1999 Synergy Mini-Survey results were as follows:
  - FH&S and NSSS Maintenance showed very significant improvement in almost all areas.
  - RP and Operations showed significant improvement in Nuclear Safety Culture and Safety Conscious Work Environment
  - Chemistry showed significant decline in almost all areas
- DCPD established a site on their intranet website for updates on the ECP program, findings of the Synergy cultural surveys and non-sensitive results of ECP Investigations. ECP members are listed and can be readily contacted by e-mail and phone.
- "Managing in NPG" is an effort to improve the safety conscious culture, training managers to be more open to employee input. First-line supervisors have been meeting monthly since December 1999, with plans to eventually include the entire plant. Evaluation questionnaires are used at every meeting to gauge progress and satisfaction.
- PG&E established "Centers of Excellence" for process support of the Asset Teams, to facilitate cost reductions, safety, and communication. The Asset Teams are streamlining procedures with workers' inputs in the process.
- PG&E conducted separate training classes for supervisors on responding effectively to employee concerns, and for other employees, to help them be more effective when raising concerns to their supervisors.
- The inclusion of the first-line supervisors and then, the entire plant was a positive move in the safety conscious culture change, and appears to be going along as planned.



- PG&E added 8 new classes for maintenance supervisors to facilitate the implementation of the cultural transition. "Process Partners" assigns individuals with experience and expertise in both maintenance issues and team process to assist the Team Leaders in implementing the Work Control Process and the "We culture."

The DCISC has found DCPD programs to provide and support a safety conscious work environment acceptable in previous periods.

#### 4.17.2 Current Period Activities

##### **Employee Concerns Program**

The DCISC met with representatives of the Employee Concerns Program (ECP). They reported that the number of formal concerns raised within that Program has decreased from previous years. Employees continue to utilize the ECP for informal contacts, which are handled through discussion, intervention or mediation. On the other hand, the number of NRC allegations from all sources concerning DCPD is higher than in previous years.

While the ECP appears to be satisfactory, it is noted that there has been an increase in the numbers of allegations, which are approximately double the average of other plants in the region. The DCISC will follow-up on this area.

##### **Organization Development Program**

The DCISC reviewed the Organization Development (OD) Program. The PG&E expectation for OD has been redefined, to deal with interpersonal skills in the organization, including training in facilitation and communication. OD personnel are doing one-on-one coaching, as well gradually replacing the outside consultants in facilitating the cultural shift.

Leadership development is continuously being assessed. The 360 feedback has been used by officers, managers, and directors, to determine leadership behaviors, important in the move from function to process management. It is tied to Performance Incentive Program goals for senior management, and it is now being introduced to the supervisors. The Synergy Survey will reflect their level of achievement.

Operations has been included in the General Supervisor Training, providing an opportunity to better integrate them into the plant. The next step is to move these skills to craft personnel. The new work groups, or Centers of Excellence, are meeting regularly, and plan on expanding their scope of synergy.

There are regular "connection events" where different employees are invited on rotation to have a "brown bag" lunch with an officer or manager, to discuss the culture change. With dwindling numbers of attendees, PG&E is considering less formal interactions, with the managers being available for informal conversation in the lunch area.

Double (function and process) budgeting began on July 1, 2000. On January 1, 2001, both function and process will give way to process only.

Regarding staffing, with baby boomers retiring, the Plant will be running into large attrition through retirement, making retention and recruitment a high priority. It takes 3-5 years to get new personnel fully effective in their jobs. All nuclear plants have the same issue, so there is more competition for skilled workers. The new hires will impact the culture, with more demand for increased attention to pay, job flexibility, and challenging of the "command and control" management style. **The DCISC believes that PG&E should take the initiative in dealing with staffing issues by developing a long-term staffing plan.**

There are major positive shifts going on at DCP, in keeping with the times and other businesses. Based on a well-accepted model by organizational transformation guru, Michael Hammer, this culture change is on par with other plants and with other industries implementing similar changes in a regulated environment.

### **Effects of Reengineering**

Reengineering is a term coined by organizational consultants and authors Michael Hammer and James Lampy. It refers to the fundamental rethinking and radical redesign of business that is directed toward desired outcome. Unlike traditional organizational structure, which is more focused on tasks, jobs, people, or structure, the focus is on process. From that perspective emerges a new range of options for improving performance in the areas of quality, responsiveness and cost-

effectiveness. The organization not only looks at how it actually performs its processes to achieve its goals, but also how the process can be improved.

Work units change from functional to process teams; jobs change from simple tasks to multidimensional; employee roles change from controlled to empowered; performance measures change from activity to results; advancement criteria change from performance to ability; executives change from scorekeepers to leaders.

At DCPD the Centers of Excellence are supports for the various processes which are now the focus. The various new programs reflect and encourage this transition from the prior, more traditional organizational structure.

### **2001 Culture Transition Strategies**

The Culture Transition Initiative was developed following concerns identified by the 1998 Synergy Safety Culture Survey. The Initiative is being taken to improve trust in management and create an improved safety conscious workforce, based on developing the following five behaviors:

1. Understand others
2. Embrace feedback
3. Provide face time
4. Develop and support common goals
5. Create a positive work environment

Officers, directors and managers have demonstrated a strong understanding of the new culture and efforts are being made to fully implement the process with the supervisors. This is the first year that individual contributors, including bargaining unit employees, will be participating in creating a new culture at DCPD. An important part of PG&E's strategy involves gaining acceptance from the bargaining unit members of the cultural changes being implemented at DCPD.

The compensation, positive discipline, and exit interview programs are examples of DCPD programs which have evolved and been aligned to support the cultural transformation process. For details, see the minutes of public meeting February 2001 and July 2000 Fact-Finding meeting (Volume II, Exhibits B.6 D.1, Section 3.5).

## Results of December 2000 Culture Survey

The DCISC met with the Supervisor of Employee Concerns Program on April 18, 2001, and May 2, 2001. The purpose was to review the results of the 2000 Comprehensive Safety Cultural Assessment that was conducted in November/December, 2000 on the plant-wide safety culture. The survey, which also included 40 employee interviews, was designed to provide comparison to the previous survey, conducted in 1998.

SYNERGY, the company designing and analyzing the survey, also compared the results of the DCPD survey to 12 other nuclear plants in their database to provide an industry ranking. The 2000 survey response by the employees showed improvement over the 1998 survey (80.4 % Vs 62%).

The first plant-wide culture survey was conducted in 1998, and the DCISC reviewed its results at its January 21-22, 1999 Fact-finding meeting (Reference 6.7), and its January 28-29, 1999 Public Meeting (Reference 6.8).

The following overall results were reported:

- Overall, the DCPD nuclear safety culture (NSC) was rated "good to very good" and was perceived as having improved (+6%) since the 1998 survey.
- The safety conscious work environment was rated "very good to excellent" and was perceived to have improved notably (+7%).
- The Employee Concerns Program (ECP) was rated "adequate to good" and was perceived to have improved moderately (+4%).

It was noted that seven of the eight previous "targeted organizations" showed significant (>10%) or notable (>5%) improvement. One of the eight, Shift Operations, remained steady, except for a decline in the Employee Concerns Program rating. PG&E and Synergy believe the decline was likely due to lingering concerns about the Operations Shift Foreman who was removed from duty in 1998.

On the other hand, the summary of results on "clearing the air on removal from duty of the Shift Foreman" showed that it appears that most Operations personnel have put this matter behind them. There remains a small but vocal minority who apparently have not, being concerned specifically about issues related to his employee concerns and to the related Department of Labor report. It appears that most of the lingering bad

feelings are directed at off-site senior management as opposed to on-site management.

PG&E's actions following the survey are as follows:

- Develop an action plan and communications schedule with the Culture Steering Team and management
- Communicate the results and action plans to plant management
- Communicate the results and action plans to employees via e-mail and site-wide meetings
- Following Outage 2R10, Managers will hold section-wide meetings to discuss results and section action plans

The 2000 Synergy Culture Survey results appeared positive for DCPD with perceived improvements in all but a few areas. PG&E is developing an action and communications plan to address results and issues.

The DCISC will continue to monitor the implementation of this plan. The DCISC believes that PG&E should take actions necessary to improve the employees' perception of the Employee Concerns Program.

#### New Behavioral Observation Based Safety Process (BOBS)

In response to an injury rate above the goal, DCPD instituted a new program to track incidents, identify barriers to working safely and institute continuous improvement in work processes and practices. Details can be found in the December 13, 2000 and June 19, 2001 fact-finding meetings. Called BOBS (Behavioral Observation Based Safety Process), the program involves many levels of the organization, with focus on the relationship between various elements: person, conditions, and behavior.

Using a specific checklist, trained craft people observe workers in the field and give immediate feedback regarding issues of job safety. BOBS is currently system-wide in maintenance, and will expand plant-wide, as at Comanche Peak, which is a flagship for the program. Craft people were sent there to benchmark and learn the program.

#### Summary of BOBS:

- Steering committee looks for barriers
- Peer observation of work by craft

- Immediate feedback
- Implementation of solutions

Results based on the program's feedback have been as follows:

1. Increase in personal protective equipment use, due to increased enforcement and greater availability.
2. With the aging work force, increased vulnerability to injury has become an issue, with risk factors that include slower reaction time, decreased flexibility, and longer healing time for injuries. As a result, precautionary measures have been implemented.
3. During the recent outage, the safety report data correlated well with minor injury reports (pink slips) produced by BOBS. As a result, they are now working on refining and reinforcing the process.
4. Motivation is high, with the workers gaining a passion for safety, with resulting increased savings and efficiency. There is an increased sense of control and empowerment, increased individual and "community" responsibility, and an increase in morale.
5. The program has helped increase safety awareness at all levels, and is supported by the overall culture. Rather than being left to the supervisor, the safety culture is pushed down to the individual contributor level. It affects not only first line supervisors, and crafts workers, but contractors as well.

The Behavioral Observation Based Safety Process appears to provide a major cultural change, and provides a positive force in increasing work safety. Even though its focus is on safety, it is teaching craft many of the concepts and skills involved in the "We culture", with resulting impact in other areas such as communication. It is an excellent way of enrolling craft in the "We Culture" not just from the top down but from the bottom up.

#### 4.17.3 Conclusions and Recommendations

PG&E's actions to improve its safety conscious work environment appear satisfactory. A cultural survey concluded that the safety culture was satisfactory and about average for

the industry; however, some employees are reluctant to bring concerns to management. PG&E has an action plan to address these findings, and the DCISC will monitor these actions.

- R01-6      It is recommended that PG&E take the initiative in dealing with staffing issues by developing a long-term staffing plan.
- R01-7      It is recommended that PG&E take actions necessary to improve the employees' perception of the Employee Concerns Program.

## 4.18 Steam Generator Performance

### 4.18.1 Overview and Previous Activities

Steam generator (SG) tube reliability is important to operational safety, because the SG tubes are part of the Reactor Coolant System (RCS) boundary. The nuclear industry has experienced substantial problems with a variety of failure mechanisms, notably tube stress corrosion cracking.

The DCPG SGs have experienced fewer tube cracks than most of the industry's SGs. This has been primarily a result of delay in the startup of the DCPG which allowed PG&E to take advantage of the industry experience with respect to water chemistry control, heat treatment of tube bends and shot peening of tube expansion areas.

The DCISC reviews steam generator performance following each refueling outage.

#### **Steam Generator Tube Inspections in Outage 1R9**

The DCISC reviewed the results of the 1R9 outage inspections of steam generator (SG) tubes. Overall, 461 tubes, or 3.4% of Unit 1 SG tubes have been plugged. This is well below the 15% technical specification limit, which would require operational limits due to safety analyses. For U-1 the leading cause of tube plugging has been PWSCC, resulting in 234 tubes plugged through 1R8. ODSCC has resulted in 60 tubes plugged.

#### **Outage 2R9 Steam Generator Inspection Results**

There were 67 tubes plugged in 2R9. Applying the ARC for Unit 2 permitted 138 previously plugged tubes to be reclaimed and saved 117 tubes from being plugged. The result was a net return of 71 tubes back to service. The total number of plugged tubes in Unit 2 is 365 or 2.7%. The leading cause of plugging in Unit 2 is PWSCC with 251; the second leading cause, ODSCC, with 46 tubes.

During previous periods, the DCPG steam generators appeared to be in good health and well within safety limits. PG&E's monitoring plan appeared satisfactory.



#### 4.18.2 Current Period Activities

The principal degradation mechanisms affecting DCP Steam Generators (SGs) include: outside diameter stress corrosion cracking (ODSCC) and primary water stress corrosion cracking (PWSCC) at the hot legs, at the tube sheets and at dented intersection and non-dented intersection; U-bend PWSCC; anti-vibration bar (AVB) wear scarring; fatigue and cold leg thinning (CLT). The degradation requires regular tube inspections during refueling outages. During the current reporting period, the DCISC reviewed the results of the 1R10 and 2R10 refueling outage SG tube inspections.

##### **Outage 1R10 SG Inspection Results**

During 1R10, a standard inspection of the SGs was performed, which took approximately ten days. The inspection included (1) inspecting 100% of the full length of the SG tubes with a bobbin; a detailed rotating coil +point probe inspection of 100% of the U-bend areas and the short radius U-bends in Rows 1 and 2; (2) 100% inspection of the hot leg top of the tubesheet; (3) 100% inspection of the hot leg dented tube support plate (TSP) intersections in critical areas, plus 20% in the buffer zone; and (4) bobbin inspections at TSP intersections.

Tube degradation was identified during 1R10 inspections of SGs 1-1, 1-2, 1-3 and 1-4. A total of 108 tubes were plugged and 43 were unplugged, for a net total of 65 tubes plugged. The overall percentage of tubes plugged for the Unit-1 SGs is now 3.9%, with a limit of 15% in each SG and 15% overall. PG&E does not expect U-1's SGs to approach the 15% limit before 2005-2006; however, a plugged tube percentage of 10% or greater would begin to have an impact on generation performance for U-1. This is due to Reactor Coolant System (RCS) flow and change in heat transfer area, requiring all turbine valves to be wide open, impacting MW generation. At 12% plugged in any one SG, PG&E believes sleeving the tubes may be necessary.

SG 1-2 has the highest percentage of plugged tubes at 8.8%. During 1R10, there were 852 tubes, which did not require plugging due to application of sizing techniques and the ARC. SGs 1-1 and 1-2 were manufactured by a different manufacturer than 1-3 and 1-4, which is believed to explain, to a great extent, the differences in the inspection results.

The Indian Point-2 U-bend tube failure experience was caused by flow slot hour-glassing due to significant denting at the upper TSP. This caused high stresses in the U-bend apex, leading to axial PWSCC. Early detection was not made during inspections, as the crack signal was masked by noise due to deposits. PG&E has implemented lessons-learned from the Indian Point-2 experience, including: (1) establishing data quality guidelines which resulted in a significant number of U-bend retests using higher frequency probes and smaller diameter probes; (2) preventively plugging 23 tubes due to unacceptable data quality; and (3) plugging 4 tubes due to small circumferential indications near U-bend tangents. One tube with circumferential indications was tested in place to 4000 pounds with no resulting tube leakage.

PG&E plans to obtain NRC approval for a revised ARC to allow tubes with >40% axial PWSCC to remain in service in time to implement this ARC for one cycle during 2R10. PG&E will also seek NRC approval of reduced ARC exclusion zone at wedge locations and will request extension of W\* ARC for another two cycles. Chemical cleaning is being proposed during 1R11 and 2R11 to remove scale and reduce the potential for free span ODSCC. Sleeving and electro-sleeving options are being investigated for eventual licensing.

It appears that SG tube plugging does not have any impact on the safety or generation of the plant at this time. The DCISC will continue to review SG tube inspections and results after each refueling outage.

#### Outage 2R10 SG Inspection Results

Inspection results for Outage 2R10, which concluded in May 2001, will be reviewed in the next reporting period.

#### 4.18.3 Conclusions

PG&E's Steam Generator (SG) program appears effective. PG&E now expects that the DCPD steam generators will last the currently-licensed life of the plant, if the NRC approves the PG&E License Amendment Requests for Alternate Repair Criteria; however, economic considerations may call for early steam generator replacement. The DCISC will continue to closely monitor DCPD steam generator performance.

#### 4.19 System and Equipment Performance/Problems

##### 4.19.1 Overview and Previous Activities

During past periods, the DCISC had reviewed the performance and problems of some DCPD equipment and systems as well as the actions taken by PG&E to resolve them. The problems reviewed include:

- Reactor Baffle Jetting
- Vessel Head Control Rod Drive Penetrations
- Failure in Welded-Steel Moment Frames
- Water in Auxiliary Feed Water (AFW) Pump Governor
- Centrifugal Charging Pump (CCP) Orifice Performance
- Cracks in Piping Connected to the RCS
- Status of the MOV Program
- Depletion of Battery Power Supply
- Containment Liner Corrosion
- Component Cooling Water (CCW) Temperature Increase
- Single Failure Vulnerability
- Impact of Ventilation System on I&C
- Relief for Reactor Vessel Inspection
- Containment Sump Screen Replacement
- Status of the Y2K Problem at DCPD
- Intake Area Concrete Delamination
- Reactor Coolant Flow Measurement Instrumentation
- Security Computer Problems
- Seismic Gap Problems
- Reactor Coolant Pump 1-3 Leakage and Repair
- Systems reviewed with the System Engineer:
  - Emergency Electrical Power System
  - Spent Fuel Cooling System
  - Fire Protection Water System
  - Security System
  - Emergency Power System

During the previous period (July 1, 1999 - June 30, 2000), the DCISC reviewed the following items:

- Seismic Adequacy of Emergency Diesel Generator Walls
- Use of Potentially-Unqualified Valve

- CFCU Motor Cracks
- SOER 98-02 Circuit Breaker Reliability
- Year 2000 Update
- Status of NRC GL 96-05 - Periodic Verification of Design Basis Capability of Safety Related MOVs
- Program to Develop and Track Plant System Health and System Long-Range Plans
- OE 97-01 - Acceptability of Continued Operation with Containment Piping Penetration Overpressure Concerns
- Turbine Blade Cracking
- Reactor Vessel Head Penetration Cracks
- Containment Debris, Sump Issues and RHR Flow Evaluations
- ISI of Containment Structures
- Security Computer Problems & New Computer System
- Control Board Degraded Lamp Sockets

System reviews with System Engineers performed during the prior period were as follows:

- Auxiliary Salt Water (ASW) System
- Main Steam System
- Emergency Diesel Generator (EDG) System

In previous periods PG&E's identification and correction of system and equipment problems has been satisfactory. Their management of plant systems using the System Engineer ownership concept has appeared effective.

#### 4.19.2 Current Period Activities

The DCISC reviewed the following system and equipment areas during the current reporting period:

##### **System Summary Health Reports and Long-Term Plans**

The DCISC reviewed DCPD system health indicators. System Engineers have a system notebook for use in monitoring the health of that system. The notebook includes:

- 1) Walkdowns
- 2) Trending
- 3) Jumpers
- 4) POAs/OEs
- 5) Maintenance Rule

- 6) Long Term Plans
- 7) Predictive Maintenance
- 8) ARs/AEs
- 9) Upcoming Maintenance Activities

DCPP had just started using a System Summary Health Report on two systems: 125/250 VDC System and Diesel Generator/Fuel Oil System. This summary is currently being expanded to other systems. DCPP planned to develop a method in 2000 to include Operations and Maintenance in the review of system performance.

The System Long Term Plan was a new program, which included issues and budgeting. DCPP had selected four systems as a pilot project and plan to have these completed in 1999. Each System Engineer develops a Long Term Plan for the system and will be reviewed by MOE (Maintenance, Operations & Engineering). The plan is sent to Estimating and Budgeting and then reviewed and approved by ARRT (Action Request Review Team). In the future MOE will make recommendations through the normal budgeting process.

Five systems plans were initially completed. The System Engineers had prepared 15 System Long Term Plans, obtained Maintenance and Operations review and input, and completed the plans by the end of 2000.

The DCISC regularly reviews systems with the System Engineer, and the review includes the System Health Report and Long Term Plans. PG&E considers the Long Term Plans a key element of the Aging Management Program.

### **Turbine Blade Cracking**

DCPP experienced cracks appearing in some blades of the low pressure turbines. PG&E believed that the cracks were not a threat to nuclear safety from a possible thrown blade becoming a missile if ejected through the turbine casing.

From an analytical standpoint, the ejection of small pieces such as individual blades lack the energy required to penetrate the casing and to be a hazard to a nuclear safety system. This is based on a Westinghouse (turbine manufacturer) analysis. This is supported by actual cases in which similar blades have separated in similar turbines without penetrating the casing. These cases include separations of one-to-five blades.

## **Reactor Pressure Vessel Integrity**

DCPP Technical Specification (TS) 5.6.6 is the licensing requirement governing reactor vessel lifetime. Extended exposure to neutrons changes the toughness of steel, raising strength but increasing the brittleness of the material. Steel exhibits a rise in the temperature at which its toughness properties change from "brittle" at low temperature to tough or ductile above this transition temperature. The TS requires that vessel steel remain in a tough condition at pressure, not only for operation but for pressure testing and early pressurization at startup when the vessel has not yet reached full operating temperature. Another limiting condition applies to a safety-related hypothetical event in which the maximum injection of emergency coolant takes place. These requirements are believed to be highly conservative, but significant uncertainties still exist in material behavior, neutron dosimetry, variation of material condition throughout the vessel wall, mechanical testing and fracture mechanics, coolant injection rates and temperature effects, and the low probability of the limiting event.

Vessel material data is obtained from surveillance capsules containing specimens that can be tested to measure toughness with a number of years of lead-time become available. DCPP has its own surveillance capsules in place in the vessel, and the first two (Unit 1) and three (Unit 2) have already been removed and tested. DCPP also has some EPRI research capsules installed for irradiation.

**DCPP continues to comply with its Technical Specification Limiting Conditions for Operation (LCO) for the reactor vessel, and its internal compliance program appears to be in order and under active attention by the plant staff.**

## **Intake Structure Inspection & Results**

Diablo Canyon's Intake Structure/Circulating Water Conduits (CWC) surveillance program, initiated in 1991 for Units 1 and 2, monitors, restores and preserves the structural integrity of the reinforced concrete structures. The inspections provide data for trending the degradation of the structures as well as providing data on the concrete condition, assessing corrosive degradation and furnishing engineering properties of the concrete to assist in the development of future inspection criteria and repair priorities. The surveillance program is

directed by ES Civil Engineering and performed by Technical and Ecological Services. Non-submerged areas of the structures are inspected annually and submerged areas (dewatered during refueling outages) are inspected once per fuel cycle based on a sampling program.

As a result of an aggressive surveillance and repair program, the quantity of the delaminations and degraded concrete at the intake structure and CWCs have decreased significantly since the inception of the programs in 1991. The surveillance and repair programs have effectively controlled the effects of the harsh coastal environment and allowed the structures to perform their intended functions. The structures are currently in good condition and are classified as (a)(2) status under the Maintenance Rule Program. The overall condition of the intake structure and the CWCs is classified as good. It appears that the aggressive surveillance and repair program implemented by DCPD has ensured that the design basis is maintained.

#### **V.C. Summer Piping Concerns**

A 4-inch circumferential crack was discovered in October 2000 at the Summer Nuclear Station in the A loop reactor coolant system hot leg piping. Further inspection and testing have confirmed axial cracking and inner wall cracking as well.

This is the first discovery of a significant crack in PWR RCS piping. Early investigations of this cracking revealed that there may well be unique circumstances which explain why this cracking occurred. The crack is at the pipe-to-nozzle weld joint. This particular joint was field-welded, and during the welding, inspection revealed improper bonding. A large part of the weld had to be chipped out and replaced. It is likely that the techniques used for positioning the pipe during this process resulted in residual stresses and perhaps other weld integrity problems.

Root cause analyses have not yet been completed. NRC has issued an information notice regarding the cracking but has not called for any actions by licensees. During the DCPD 1R10 outage, an experienced staff engineer from the In-Service Inspection group visually examined primary piping to nozzle weld joint regions. No indications of cracking or leakage were found.

## **Security System Computer Performance and Long Term Plan**

DCPP replaced the main frame security computer in January 2000 and experienced some startup problems; however, the overall system appears satisfactory. At the request of NQS, Security has begun implementing the Corrective Action Program by generating ARs to identify problems and track their resolution; however, their program to trend security equipment problems was not being implementing properly. They presently do not have a long-term plan for security equipment, but intend to develop one.

Security has performed four self-assessments this year to identify issues and correct them. They have implemented a supervisor observation program for each supervisor to perform once each month. Security Services has not formalized a Human Performance Program like other departments. The Director is on the DCPP Human Performance Steering Committee. Security is considering doing more in improving human performance and has started trending information on how security personnel impact security events.

Security has lagged behind other departments at the plant in implementing the Corrective Action Program, Human Performance Program, and System Long Term Plan Program. The DCISC believes that PG&E should determine the extent to which these normally used plant programs (and possibly others) apply to Security Services and develop an implementation plan.

### **RCS Hot Leg Flow Measurement**

The DCISC reviewed an update on Reactor Coolant System (RCS) flow measurement. This topic involved the development of a new analytical model for the existing flow instrumentation to permit increased operating margins, specifically full power operation with the Technical Specification 15% steam generator tube plugging limit. Several other nuclear plants had obtained NRC approval to use the new methodology, and DCPP was preparing a new submittal to NRC. NRC had not approved a previous DCPP submittal because of hot leg thermal streaming, which could adversely affect the readings.

DCPP is sending operating data to Westinghouse for the development and substantiation of a DCPP model; however, there was no money budgeted for 2001 for the development. Revised analysis and a Westinghouse topical report are planned for 2002.



Other plants have made submittals to NRC and have received approval. Sequoyah utilized 10CFR50.59 for the change, but NRC is not accepting this approach any longer. South Texas Plant received approval but is not using the model. McGuire Nuclear Station uses an approved methodology but from a different model. DCPD had considered an ultrasonic flow detector, but it is expensive and requires more extensive calibration.

Apparently, DCPD will not take any actions on the new RCS flow measurement methodology until 2002, due to budget considerations.

DCPD is proceeding slowly on using the new Reactor Coolant System hot leg flow measurement methodology due to budget considerations; however, there is no adverse safety impact and no urgency until steam generator plugging gets close to the 15% limit. With the long time, which has passed since this program was started, and the mixed results with similar projects in the industry, PG&E may wish to re-examine its plans.

The DCISC reviewed the following systems with their respective System Engineers as part of its ongoing system reviews:

#### **Control Room Ventilation System**

The CRVS functions to provide a habitable environment in the Control Room (CR) to allow operators to remotely manipulate systems, structures and components to shut down the reactor and maintain it in a safe shutdown condition. The CRVS operates during normal operation and off-normal and accident modes. Units 1 and 2 contain separate and independent CRVS. The safety-related system is designed to enter one of the following modes, depending on plant conditions:

- Mode 1: Normal Operation
- Mode 2: Smoke Removal
- Mode 3: Full Recirculation (when the other unit goes into Mode 4)
- Mode 4: Accident

Activation into a particular mode is by a Safety Injection Signal, radiation monitor signal or manually. Manual activation would occur, for example, upon smoke generation from a fire. In normal operation supply air is pulled from the normal air intakes mounted on the ends of the turbine

building, filtered and conditioned prior to being admitted to the CR. In Mode 4 the outside air intake is changed to a remote intake, and the system activates heaters and high efficiency particulate & charcoal filters to remove radioactive or other contaminants which might be released within or outside the plant in an accident. The system is designed to maintain a slightly positive pressure in the CR to prevent unfiltered in-leakage. Portions of the system are safety-related, i.e., necessary to function during accidents.

The DCISC reviewed Maintenance Rule Performance Reports on the CRVS. The results for the CRVS appeared satisfactory.

The System Engineer led the DCISC on a walkdown of the system using the System Engineer Walkdown Checklist and pointing out significant system features and components. The physical system observed appeared satisfactory.

**The DCPD Control Room Ventilation System appeared satisfactory, and the System Engineer was knowledgeable about the system.**

#### **Low Level Liquid & Solid Radwaste Handling Systems**

The liquid radwaste system included the Chemical and Volume Control System, Spent Fuel Pool Cleanup System, and Boron Recycle System. System inputs, processing equipment, alignment, and discharges were described. Annual radioactive waste discharges have been a small fraction of NRC limits.

The Solid Radwaste System included Spent Resin Transfer, Spent Filter Handling, Mobile Vendor Packaging, and Dry Active Waste Packaging. PG&E has on-site storage space for about 500 boxes of Class A waste and has contracted with Envirocare Disposal to dispose of some solid waste. DCPD plans to dispose of Class B & C waste at Barnwell, SC as long as that site is open and use Envirocare. The plant has about 18 years' storage space on-site.

#### **Auxiliary Saltwater System**

The ASW System supplies cooling water to the Component Cooling Water heat exchangers from the ultimate heat sink (Pacific Ocean) in order to reject heat from primary plant systems.

The only significant active components are the redundant Auxiliary Salt Water Pumps located in the Intake Structure.

There are two ASW Pumps for each of the two redundant trains of the system. Each pump is located in a watertight compartment to prevent water damage to the motor as a result of flooding or tsunami. Watertight doors assure that flooding of one compartment does not affect the opposite train operability, thus maintaining safe shutdown capability. The System Engineer reported that an ASW Pump could be replaced on-line, if necessary, in about 60 hours as compared to the 72-hour Technical Specification allowed outage time.

The ASW system long-term plan was developed by the system engineer for system improvements, upgrades, modifications or major repairs/maintenance to assure long-term reliability. The plans for ASW appeared satisfactory.

The DCISC team reviewed ASW system health, i.e., performance indicators, which were based on the Maintenance Rule Program. One component, a CCW heat exchanger, was in Alert status due to having a higher rate of fouling than others. Also, some ASW vacuum breakers had been sticking but had been repaired. Several years ago, ASW underground piping near the intake structure had experienced severe corrosion and was replaced. The DCISC had monitored this replacement at the time and had found it satisfactory. All indicators showed that ASW had been operating satisfactorily.

The DCISC toured of the accessible portions of the ASW System both at the intake structure and in the plant, observing items normally inspected on the system engineer monthly walkdown and inspection. The system appeared in good order, and the plant appeared in good materiel condition.

The Auxiliary Salt Water System, DCP's connection to its Ultimate Heat Sink (the Pacific Ocean), appeared to be in good operating and readiness condition. The System Engineer appeared to be knowledgeable and up-to-date on the system design, performance and health.

#### **System Review - Component Cooling Water (CCW)**

The DCISC reviewed the CCW System Health Report for the first quarter of 2001. The System Health Report lists information on:

- Performance Indicators
- Performance Indicators Discussion
- SSC's in Maintenance Rule (MR) a(1) Status

- Scheduled Major Maintenance or Modifications
- System Long Term Plan's (LTP's) Requested or Approved for Current Year
- NRC Issues/Self-Assessments/Engineering Analysis

PG&E reported that the overall condition of CCW system is good, based on the System Health Report.

The System Notebooks document the monthly formal system walk downs, the weekly tour (looking at the plant) and the LTP. The System Engineer reviewed the LTP for this system. The plan consists of:

- 1) LTP Summary, which lists the item number, budget year, approximate cost, item description, status and date of status.
- 2) Appendix A - Detailed information on each item.
- 3) Appendix B - Excluded/Declined/Completed LTP Items

All System Engineers are to have a System Health Report ready for each system before start of 2R10. The System Engineer will then show these reports to Operations Department to get them to use it. The System Engineer reported that the System Health Reports are presently being used by the Engineering Department but do not get much use by the other Departments.

It appears that the System Health Reports and the Long Term Plans are useful in determining the condition of the system and planning long-term maintenance or modification on the system. From information reviewed on the System Health Report, the Component Cooling Water System appears to be in good condition.

The DCISC believes that PG&E should develop a plan for how these reports should be utilized by Operations and Maintenance.

#### 4.19.3 Conclusions and Recommendations

PG&E appears to have taken appropriate action in addressing system and equipment performance issues; however as noted in several instances, the DCISC believes additional work is needed and has provided recommendations accordingly. The DCISC will continue to review this area as part of its normal activities.

- R01-8      It is recommended that PG&E apply the normally used Corrective Action Program, Human Performance Program, and System Long Term Plan Program (and possibly others) to Security Services and develop an implementation plan.
- R01-9      It is recommended that PG&E develop a plan for how System Health Reports and Long Term Plans should be utilized by Operations and Maintenance.

## 4.20 Training and Development Programs

### 4.20.1 Overview and Previous Period Activities

The DCISC has looked at the following development, culture change, and improvement programs at DCPD during the past reporting periods:

- Facilitative Leadership program
- Outdoor day-long team-building program
- Operations Personnel Training - much-needed training in building communication skills, besides technical competencies, and bringing DCPD up to current high standards
- Cultural Strategy Training - to help clarify DCPD's current culture, as reflected in part by the Synergy Report, and design one that is optimal, particularly for the new competitive environment
- Operator Training Program Self-Assessment - The DCPD self-assessment of actions on areas-for-improvement from the INPO operator training program accreditation appeared to be sufficiently responsive.
- Observation of "Managing for Nuclear Safety Revisited" training - informative and on-target in preparing supervisors to effectively receive and respond to employee concerns
- "Observation and Intervention Skills" Training - to help operations supervisors better observe operators at work, assess their performance, intervene when necessary, and reinforce good behavior.
- Asset Team Support - Human Performance support of the asset teams had dwindled as did the relationship with the SPARK team. The DCISC believed that these coach-the-coaches meetings should be reinstated.
- Supervisory Leadership Meeting - Follow-up to the previous Cultural Strategy training with upper management, now geared to supervisors
- Observation Operator Re-qualification Class - to review and be able to trouble shoot failures in the emergency diesel generator
- INPO Accredited Training Programs - There are twelve INPO-accredited training programs, which are currently under the purview of the Learning Services organization. For details, refer to minutes of Sept public meeting. Six of these accredited training programs focus solely on the Operations organization: Non-licensed Operator, Reactor Operator, Senior Reactor Operator, Shift Manager, Shift Technical

Advisor, and Operations Continuing Training. Two of the INPO-accredited programs serve both the Chemistry and Radiation Protection organizations, as their personnel are multi-functional. INPO-accredited programs are also focused on Mechanical Maintenance, Maintenance Supervisor, and Engineering Support.

**The DCISC has found that the DCPD training and development programs acceptable in previous periods.**

#### 4.20.2 Current Period Activities

##### **Observe Shift Technical Advisor Training Class**

The purpose of the training was to present the knowledge necessary for STA-qualified individuals to perform Plant Engineering Procedure PEP M-98A used to calculate the feedwater nozzle-fouling factor and maximum expected electrical generation. The training lasted two hours for the five STAs (one per operating shift). The procedure had previously been implemented by Engineering Services during their normal day schedule but was being assigned to the STAs because of their 24-hour presence at the plant.

A student handout was provided which included pertinent drawings, theory and equations, equipment set-up, and other technical and procedural information. The instructor distributed photographs of clean and fouled nozzles. The instructor maintained good interaction with the class by asking questions and stimulating discussion. Following the classroom session, the STAs went into the plant and actually performed the procedure (not observed).

The Shift Technical Advisor qualification training in performance of the DCPD procedure for setting final feedwater nozzle venturi readings by ultrasonic crossflow appeared appropriate and effective. The instructor exhibited good knowledge of the subject and interacted well with the students.

##### **Tracking Data Concerning the Accredited Training & Instructor Training Programs**

The DCISC discussed with Maintenance Training and Chemistry/Radiation Training Instructors the various means

that are used to track data concerning the accredited training and instructor training programs.

There is a Senior Management Oversight Training Committee and each group has an oversight training committee. These committees meet quarterly or more often if necessary to review the status of performance, problems and actions taken for each of the accredited training programs.

A Performance Plan Review Report is prepared monthly for the accredited programs and quarterly for the instructor training program. The information for the Performance Plan Review Report is gathered by the instructors and sent to the Director of the line organization for approval. The report has an executive summary that lists 1) summary of the month's training, 2) the top 5 training program issues and 3) areas for improvement (and work in progress). The report also includes answers to a list of 10 questions (each question is worth a total of 10 points) on the overall performance of the training program for that period. Operations training programs must have a pass grade of 80% and the other training programs a pass grade of 70%.

The performance plans were reviewed for Instructor Training Program, Technical Maintenance, Mechanical Maintenance and Chemistry/Radiation Protection.

It appears that the method DCPD has for tracking the performance of the accredited training & instructor-training programs is comprehensive and involves both the training and line organizations. The DCISC will review the Performance Plan Review for the remaining of the accredited training programs in the fall of 2001 and all of the Performance Plan Reviews in 2002 to determine the status of the improvements that DCPD identifies.

#### 4.20.3 Conclusions

The DCPD training and development programs appeared satisfactory, and the DCISC will continue to monitor them.



#### 4.21 Strategic and Business Plans

##### 4.21.1 Overview and Previous Activities

California Assembly Bill 1890, passed in 1996, legislated electric rate restructuring in California. With deregulation coming in the electric utility industry in California beginning in 1998, PG&E has been preparing for competition by realigning its organizations and rate structure and reducing costs of generating and delivering electricity. DCPD is following the corporate lead by doing its part in reducing costs and critically reviewing its ways of doing business.

PG&E hoped to reach its competitive position primarily through redesigning many of its processes to be more efficient and require fewer personnel. Twelve of the most significant processes have been scheduled for redesign. In addition, eight other initiatives, including Unit 1 uprating and Increasing Spent Fuel Storage, have been identified. Most of the efforts were completed by 2000 with some continuing into 2002.

PG&E has developed a DCPD Five Year Business Plan. The purpose of the plan was to be sure all departments' goals and plant goals match and have total alignment. Prior to the business plan, the plant and department goals and objectives did not have total alignment.

PG&E began discussions in July 1999 to form a Joint Utility Venture (JUV). The JUV was a potential venture with four other similar, well-run nuclear stations (Callaway, Wolf Creek, South Texas and Comanche Peak) to explore shared cost savings and increased industry influence through alliances and to ultimately decide whether to form a joint nuclear operating company (JNOC).

The name was changed to the Strategic Teaming and Resource Sharing (STARS) initiative. A STARS management structure was established and implementation teams would be created to begin on approved initiatives. New functional teams will be created to explore the next opportunities, and the Joint Nuclear Operating Company economic feasibility study will begin in 2001.

One priority remaining was to develop a culture supportive of the business changes. The so-called "We Culture", shaped by an outside consultant team, emphasizes ongoing communication and

feedback. The DCPD supervisors have been added to the ongoing process, and have been meeting regularly ever since.

**In previous reporting periods PG&E's transition programs and activities appeared satisfactory with no apparent adverse effect on safety of operations.**

#### 4.21.2 Current Period Activities

DCISC reviewed Strategic and business Plans at four Fact-Finding Meetings (Volume II, Exhibit D.4, D.5, D.6, & D.8) and one DCISC Public Meetings (Volume II, Exhibit B.6) as described below.

##### **Five Year Business Plan**

The DCISC reviewed the Five-Year Business Plan at the December, 2000 Fact-Finding Meeting (Volume II, Exhibit D.4), and PG&E made a presentation on the Plan at the February, 2001 Public Meeting (Volume II, Exhibit B.6).

PG&E reported that their Five-Year Business Plan is a strategic performance plan, which identifies key focus areas and that the Plan is updated annually. They reviewed some of the major initiatives, past and future, which have or are expected to impact DCPD operations. These efforts should bring DCPD operating costs down to permit the plant to operate effectively in the competitive electric power market in California. The Cost Management Plan, Performance Plans and the Re-Engineering Program were integral parts of efforts to reduce the cost. These efforts were largely successful in reducing the costs and, given the present state of the market for electric power in California, there is no question that DCPD is a very competitive generating resource.

PG&E discussed the four separate strategies to facilitate the transition of DCPD to the new market environment. These include: 1) the STARS alliance formed with four other nuclear plants with very similar designs to DCPD and that a joint nuclear operating company may eventually emerge from the STARS alliance; 2) continuing the Process Focus for addressing re-engineering and cultural change efforts in terms of budget, costs, goals and organizing personnel to break down functional barriers; 3) continuing encouragement and development of cultural change within the DCPD organization; and 4) market development and creation of a strong market as that market

evolves.

PG&E reviewed and discussed the DCPD Performance Plan through 2004 and beyond, which defines PG&E's overall goals for the DCPD organization into safety, industry leadership, generation performance, financial performance, and human performance categories. For every overall goal established by the Performance Plan, there is a corresponding plan to functionally link that overall goal within the organization, and the implementation plans are organized by process or by Centers of Excellence concepts.

PG&E also intends to work with its STARS partners to meet long-term staffing requirements for the DCPD organization and plans are in place to secure, train and develop and maintain a workforce with the necessary skills required to continue operating DCPD.

It appears that the Five-Year Business Plan is helpful in aligning the department and plant goals and objectives. DCISC will review this plan at Fact-Finding Meetings after they are developed each year.

#### **Strategic Teaming and Resource Sharing (STARS)**

The DCISC received updates on the STARS Program at the December 2000 and May 2001 Fact-Finding Meetings (Volume II, Exhibit D.5 & D.8). STARS is an effort to consolidate the resources of five similar nuclear stations to achieve economies of scale and greater reduction of risk. The stations are Diablo Canyon, South Texas, Comanche Peak, Callaway and Wolf Creek.

Work in progress includes 1) Labor-Sharing Oversight; 2) Digital Control Systems Upgrades; 3) Refueling Services; 4) Fuel Services; 5) Common In-Processing; 6) Control Room Habitability; 7) Risk-Informed ISI Project; 8) Common Event Reporting Program; and 9) 10CFR50.59 Project.

The five Chief Nuclear Officers met in April 2001 and agreed on a collaborative document for moving forward with STARS. The venture has heard that both INPO and NRC are interested in considering dealing with the five stations "as one" to the degree possible. PG&E believed that all the shared initiatives were going well. In the financial area, use of common contracts appeared to be saving 7-10%; however, some vendors were wary due to existing separate contracts (e.g., turbine

maintenance). To date the STARS initiative has exceeded its cost savings goals (i.e., over \$5 million at the end of 2000) mostly in the supply chain area. There has not been much opportunity for labor sharing during outages because of the similarity of schedules.

STARS stations will be looking more at operating, generation and service companies in 2001. A study will be performed to determine what value exists in this approach. In any event, STARS will continue as an alliance looking to share strengths. The participants will begin looking at pilot programs to determine how they can get the most out of intangibles.

**The DCPD participation in the Strategic Teaming and Resource Sharing (STARS) appears to be continuing as planned, and there have been cost savings as expected. There does not appear to be any adverse impact on nuclear safety.**

#### **Transition Program to Prepare for Competition**

DCISC reviewed the status of the Transition Program for the year 2000 at the December, 2000 Fact-Finding Meeting (Volume II, Exhibit D.5). The remaining action of the Transition Plan has been incorporated into DCPD Performance Plan or Center of Excellence (COE) Plans. There is a Performance Incentive Plan (PIP), and Performance goals are based on functional processes. Budgeting is based on the four Core Processes and COE. The four Core Processes are 1) Production; 2) Manage Plant Assets; 3) Supply Chain; and 4) Revenue Realization. The six Centers of Excellence are: 1) Engineering; 2) People Performance; 3) Business Support; 4) Loss Prevention; 5) Information Management; and 6) Maintain License.

All personnel are in one of the COEs and then loaned out to the Processes. The budget for the year 2000 was reviewed, as was the overall status of the DCPD Transition Plan. The status of each of the elements of the Transition Plan were discussed.

Original plans had some assumptions that are no longer valid and will be revisited. Staffing at DCPD is currently at 1257. Over all, the Transition Plan is largely complete.

**It appears that DCPD has completed their efforts with the Transition Program and has the implementation well under way.**

## **Performance Plans**

The DCISC met with DCPD Personnel from the Business Support Group at the March, 2001 Fact-Finding Meeting (Volume II, Exhibit d.6) to follow up on an item from the February 2001 DCISC Public Meeting (Volume II, Exhibit B. 6) on DCPD performance plans. PG&E covered the high level strategic plan at the public meeting, and the DCISC was interested in the lower level implementing plans and the DCPD Performance Plan.

The overall DCPD Performance Plan contained results achieved in 2000 and those to be achieved in 2001 - 2004 (and beyond). The major areas of focus are 1) Safety; 2) Industry Leadership; 3) Generation Performance; 4) Financial Performance; and 5) People (Performance, Development, Sustain an Excellent Workforce, and Learning Organization).

The overall DCPD Performance Plan was broken down into nine process-based and Center-of-Excellence-based Performance Plans. This is a new breakdown for DCPD and a departure from the previous functional organization. These process plans contained process-specific actions and numerical measures for the period 2001-2004 in the categories of Safety, Industry Leadership, Generation Performance, Financial Performance and People. These strategies, measures and goals are aligned with the higher-level DCPD goals. Individual manager and contributor performance plans will be aligned with these goals. Thus, each employee should have a "line of sight" from his/her individual and team plans to the DCPD plan.

Nuclear safety was included in these plans in eight measures/goals. These were further specified in the process-based plan actions and measures.

The DCISC believes the hierarchy of DCPD performance plans represented an effective method of disseminating management expectations to the whole organization. Nuclear safety is appropriately addressed. The DCISC should follow up periodically to assess how effectively the plans are being implemented.

### **4.21.3 Conclusion**

It appears that the Five-Year Business Plan is helpful in aligning the department and plant goals and objectives. Also, the hierarchy of DCPD performance plans

represented an effective method of disseminating management expectations to the whole organization. Nuclear safety was appropriately addressed. The DCISC will follow up periodically to assess how effectively the plans are being implemented.

## 5.0 DCISC PERFORMANCE INDICATORS

The DCISC uses 18 selected performance indicators (PIs) to measure the safety performance of the Diablo Canyon Power Plant. These PIs are updated for each DCISC public meeting and presented with more detailed supporting information by PG&E. The PIs in the enclosed table represent those presented at the DCISC June 2001 Public Meeting. At its June 2001 Public Meeting, the DCISC decided to replace these PIs with a combination of existing INPO, NRC and DCPD performance measures. The use of these indicators will be developed during the next reporting period.

## 6.0 DCISC OPEN ITEMS LIST

The DCISC Open Items List is a database used to track items for follow-up and monitoring. The List is updated and reviewed at each public meeting. The Open Items List included in Exhibit F in Volume II was used at the DCISC June 2001 Public Meeting.



## 7.0 PUBLIC INPUT

During the current reporting period, July 1, 2000 - June 30, 2001, the Diablo Canyon Independent Safety Committee (DCISC) provided the opportunity for public input at the following DCISC public meetings:

September 14 & 15, 2000	Public Meeting at The Cliffs at Shell Beach Conference Center at Shell Beach
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February 7 & 8, 2001	Public Meeting at The Cliffs at Shell Beach Conference Center at Shell Beach
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June 20 & 21, 2001	Public Meeting at The Cliffs at Shell Beach Conference Center at Shell Beach
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Additionally, on February 7, 2001 a tour of DCPD was conducted for 15 members of the public, all three DCISC Members, and three of its consultants (reference Section 1.4.4 of this report). During the plant tour, several members of the public asked specific questions about plant and equipment being observed. These were all answered by PG&E or DCISC.

During the three public meetings, members of the public raised the following issues/concerns as follows:

### September 14 & 15, 2000 Public Meeting

No members of the public provided comments at the September 14 & 15, 2000 public meetings.

### February 7 & 8, 2001 Public Meeting

The following two persons spoke at the February 7 & 8, 2001 public meeting:

Mr. John Gagliardini of Arroyo Grande, California expressed his opinion that PG&E should receive contracts for further research and development efforts concerning nuclear power. He stated that he had reviewed information on other PG&E projects in the local area including the Gunneson Land Project 18PO13, and he expressed his opinion that it was not PG&E's fault that these projects did not ultimately result in additional electric power generation. There were no questions or

comments and the Chair then thanked Mr. Gagliardini for his comment.

Mr. Les Goldfisher directed the Committee's attention to a lecture being held that evening, at California Polytechnic University in San Luis Obispo, by Professor Ernest J. Sternglass concerning the health effects of nuclear fallout and releases from the operation of nuclear power plants. Mr. Clark noted that all the Committee Members have been long aware of Professor Sternglass' views. Dr. de Planque commented that she has been aware of Professor Sternglass' studies for 30 years that the evidence was not sufficient to sustain Professor Sternglass' conclusions concerning the effects of radiation and that his claims have not been substantiated by significant numbers of scientists working in the field, both in this country and abroad. Mr. Clark also noted that there is an extensive radioactivity monitoring program of the local area around DCP, reviewed regularly by the NRC, which has consistently shown the radiation levels around the Plant are undistinguishable from natural background levels existing in nature and that studies have consistently shown that the impact of the operation of nuclear power plants on radiation level is low and does not present a health issue.

#### June 20 & 21, 2001 Public Meeting

The following persons spoke at the June 20 & 21, 2001 public meeting:

Ms. June von Ruden, a resident of Pismo Beach, observed that in her opinion the forum provided by the Committee is a valuable one and that it was unfortunate that more members of the public did not choose to attend. She suggested that the public comment period should be at the beginning of DCISC public meetings for those who cannot wait until the scheduled presentations for a session have concluded, and also noted that the use of the reference to "Technical Presentations" in the notices of meetings of the Committee might discourage some from attending its meetings. The Chair and Members believed that this was a good idea and agreed to take Ms. Von Ruden's suggestions under advisement.

Ms. von Ruden reported that a staff person from DCP had sent her a letter in April to express concern over the Synergy report characterization of certain aspects of DCP operations as "adequate" or "nominally adequate." The writer expressed concern over working conditions and lack of ability to interface with DCP management. Her contact also expressed a belief that the Employee Concerns Program (ECP) was useless and that DCP employees harbor significant mistrust of PG&E

and the NRC. Her source alleged that management's actions were resulting in very significant levels of stress on the DCPD workforce and that outage operations were given a higher priority by PG&E than employee stress and fatigue. Ms. von Ruden provided the DCISC with a copy of the letter, after blocking out identifying information. The DCISC chair responded that the letter would be of interest to the Committee.

Ms. von Ruden remarked that emergency planning cannot wait until a crisis occurs. She noted that this particular day has been denoted as "Lights Out Day" by some organizations, a day when electricity users were being asked to join in a protest by curtailing their use of electricity for 4-5 hours and she questioned if that action might affect DCPD operations. DCISC Members replied that, as electricity demand varies drastically on a daily basis, it was highly unlikely that this protest would have any impact on generation facilities in California.

Ms. von Ruden inquired whether re-racking to change the capacity of the present Spent Fuel Pool was really a viable option for PG&E. She remarked that an engineer who claimed to have been involved in the construction of the original Spent Fuel Pool rack configuration had informed her some 20 years ago that the steel in those racks had cracked. She inquired whether the hillside located near the proposed dry cask storage facility was subject to the type of landslides common in the local area and she questioned whether the bolting process would be adequate to its purpose. She also inquired as to the cost of installing one canister on the pad and whether this work would be done by DCPD or PG&E's contractor personnel. The DCISC Chair replied that the regulatory approval process requires soil sampling to determine the adequacy of the proposed site and other issues raised by Ms. Von Ruden would also be addressed by the approval process. PG&E's Mr. Dave Oatley stated that any re-racking proposal of the Spent Fuel Pool would require further NRC approvals and public input.

Ms. Sheila Baker of San Luis Obispo suggested that the Committee consider inviting members or representatives of the unions and other non-management personnel working at DCPD to speak to the Committee during its regular public meetings to open up the dialogue beyond what is achieved by having only PG&E management make presentations to the DCISC. The DCISC Chair replied that the Committee will consider how to better open the public meeting process and dialogue to all who may wish to address the forum. Dr. Cass observed that while PG&E's efforts are having a positive effect on safety, a barrier exists between management and employees.

Ms. Baker asked whether plans for the proposed Yucca Mountain storage facility would affect the fuel storage situation at DCPD and whether rail or barge transportation might be utilized. Mr. Oatley of PG&E replied that, if available, Yucca Mountain would be an option for storage of DCPD spent fuel. He stated that no transportation mode had been selected, but the Holtec cask storage system allowed for transportation options. The DCISC Chair replied that any future method of transportation of spent fuel would be subject to a rigorous regulatory approval process including public hearings.

Ms. Pam Marshall Heatherington, the Executive Director of the Environmental Center in San Luis Obispo, expressed her concern regarding negotiations between PG&E and the Creditor's Committee established by the Bankruptcy Court. She asked whether different reorganization plans might be presented for consideration. The DCISC replied that it was following the safety of DCPD with regard to the bankruptcy and would likely review any proposed reorganization plan to assess its effect on plant safety. She reminded the Members that the DCISC bears a heavy responsibility to represent the public.

Ms. Heatherington questioned why PG&E was unable to respond concerning Holtec's use of helium in the dry cask spent fuel storage canisters. The DCISC replied that use of an inert gas for these applications was well known and that adequacy of the particular selection was not a concern. Ms. Heatherington inquired if the power lines serving the 230kV and 500kV switchyard would pass over the proposed dry cask storage facility. Mr. Oatley responded that this matter would be analyzed in PG&E's application for the facility.

Mr. David Weisman, a resident of Morro Bay, stated that he was alarmed concerning the bankruptcy situation and the availability of fuel for the DCPD emergency diesel generators. He questioned whether PG&E management, in making a decision whether to bring in a fuel truck, might feel pressured between the need for financial economy and the need to ensure a sufficient supply of diesel fuel. The Committee responded that it was satisfied with DCPD's diesel fuel supply and that it was following the safety of DCPD operations during the bankruptcy.

Mr. Weisman stated that dry cask storage for DCPD fuel was being treated as an inevitable event, while the reasons for dry cask storage were not being adequately addressed. He questioned whether the availability of a proposed storage facility for nuclear waste to be located at Yucca Mountain, coupled with the proposed increase in on-site dry cask storage

capacity at DCP, might lead to an extension of licensing for DCP and require further debate on fundamental issues concerning viability and advisability of continuing the use of nuclear power and the consequent creation of more radioactive waste. He also remarked that he had questions concerning the delay of the geotechnical reports and concerning the high temperature of stored fuel, in the event that it was buried by a landslide due to a seismic or other event. He mentioned a study by a Professor Resnoff which seemed to indicate the temperature of the stored fuel could be raised significantly and result in a danger of melting the shielding materials which might subsequently ignite and burn, or possibly lead to the melting of the fuel itself. He observed that the Plant site is located along the coast and might be vulnerable to attack by terrorist launched from open water. He remarked that the public input to the debate concerning on-site storage of spent nuclear fuels is solicited concerning the small details and is not focused or solicited with reference to the overall considerations. He noted that state standards, as well as those of other federal regulatory bodies, may differ from the standards set by the NRC. Mr. Weisman believed the public would be interested to know how these questions would be addressed by the licensing and approval process. The DCISC Chair replied that the licensing and approval process requires these questions be addressed. PG&E's Mr. Strickland responded that PG&E has committed to seismic design safety and maintains a geosciences department which studies long-term seismic impacts.

Mr. Weisman observed that the lack of many members of the public at the public meetings of the DCISC may reflect the public's perception that PG&E's plans are already firm and any further discussion would necessarily concern only the technicalities of achieving a result which has already been determined and is beyond the ability of the public to have meaningful input into the matter.

Mr. Weisman also observed that the current membership of the DCISC reflects science and technical backgrounds. He asked how someone with a background in public health and safety might receive consideration for appointment to the Diablo Canyon Independent Safety Committee. A DCISC Member replied that the appointing officials take seriously a nominee's concern for public health and safety and that technical understanding of how a nuclear power plant operates is essential to assessing safety.

Ms. Fay Magillhill observed that she was impressed with the efforts being made to address safety; however, she asked whether the Committee adequately examines worst case scenarios

when reviewing safety of DCPD operations. The DCISC Chair replied that if the Committee were aware of any undue risk, it is obligated to raise the issue with PG&E, NRC or state agencies. Ms. Magillhill believed that people living near nuclear facilities are better able to judge whether a plant should remain in operation than the regulators, who are heavily involved in nuclear power issues on a broad basis. The DCISC Vice-Chair responded that at the NRC safety is the primary concern. Ms. Magillhill urged the Members of the DCISC to maintain an openness beyond their own professional and technical backgrounds in nuclear power. The DCISC Chair replied that none of the Committee Members have any professional connection or financial or other investment in PG&E or DCPD.

These appearances by the public are documented in Volume II, Exhibits B.3, B.6, and B.9 (public meeting minutes) of this report and reported verbatim in the meeting transcripts on file at the Diablo Canyon Public Document Room in the California Polytechnic University Library in San Luis Obispo.

Letters and phone calls have been received by the DCISC Legal Counsel's office with questions, concerns and requests for information. During this reporting period, 26 calls were received from individuals on the DCISC toll-free telephone line. The breakdown of these calls is as follows:

<u>Number of Calls</u>	<u>Number of E-mails</u>	<u>Reason for Contact</u>
15	-	Inquiry about February 2001 plant tour
6	27	DCPD issues or nuclear information requests
5	3	Other (administrative, document requests, media and miscellaneous other than from the public)

When requested, answers, responses or documents were provided either during the call, a return call, or by a letter or documents from the Committee. The DCISC Telephone/Correspondence Log is included as Exhibit G.1 and correspondence with the public is included as Exhibit G.2.

The Committee maintains a California toll-free telephone number (800-439-4688), an E-mail address ([dcfsafety@dcisc.org](mailto:dcfsafety@dcisc.org)) and a site on the World Wide Web at [www.dcisc.org](http://www.dcisc.org) for receiving

questions, concerns or information to and from the public. The DCISC has developed an information pamphlet describing the Committee and its function (see Volume II, Exhibit I).

DCISC activities and meetings are documented for public information in several ways as described below. All documents are available at the Public Document Room at the California Polytechnic University (Cal Poly) Library in San Luis Obispo, CA.

- An Annual Report is published each year (July 1 through June 30) which is a comprehensive description of Committee activities throughout the period.
- Minutes of each Public Meeting are contained in the Annual Report and at the Cal Poly Library.
- A transcript of each Public Meeting is maintained at the Cal Poly Library
- Reports of DCISC visits to the Diablo Canyon Power Plant are contained in the Annual Report.

## 8.0 PG&E ACTIONS ON PREVIOUS DCISC REPORT RECOMMENDATIONS

The DCISC has made 154 recommendations in its previous Annual Reports. The recommendations, PG&E responses and DCISC dispositions from the previous DCISC reporting period are included in Exhibit H in Volume II, along with references to the location for the bases for the recommendations.

PG&E's initial responses to the 13 DCISC recommendations in the last Annual Report were included in Section 8.0 of that report. At its February 7, 2001 public meeting the DCISC found all PG&E responses satisfactory; however, follow-up or monitoring was required on several recommendations as reported in Exhibit H.

The PG&E responses to all of the recommendations made in the current report are contained in Section 10.0. DCISC comments on the PG&E responses to the current DCISC recommendations will be made in the next DCISC Annual Report.

Overall, the DCISC concludes that the actions taken by PG&E relative to past DCISC recommendations have been satisfactory and have helped to maintain or improve safety and reliability.



## 9.0 CONCLUSIONS, CONCERNS AND RECOMMENDATIONS

During the eleventh annual period (July 1, 2000 - June 30, 2001) since its inception in late 1989, the Diablo Canyon Independent Safety Committee (DCISC) held three public meetings in the vicinity of Diablo Canyon Power Plant (DCPP). The meetings included numerous technical, programmatic and plant status presentations by PG&E and input from the public. In addition, Committee Members and/or Consultants have performed several plant tours (including a general plant tour with 15 members of the public) and nine fact-finding visits and inspections at DCPP. The DCISC Chair visited the California Attorney General's offices to brief the staff on DCISC activities. The DCISC employed two general/nuclear safety consultants and one medical/human behavior consultant to review a large variety of nuclear plant operations, documents and concerns. These efforts and activities are documented in this report.

### 9.1 Conclusions

Based on its activities, the DCISC concludes that PG&E has operated and maintained the DCPP safely during the period.

Specific conclusions are:

1. PG&E appears to be taking positive steps in reviving neglected portions of its Aging Management Program with new leadership, augmented management support, and several new initiatives (the latter due in large part to aging-related failures of plant components). The DCISC has had concerns about the program in the last several reporting periods and is pleased to see progress towards improvement. A major element of DCPP aging management is the system long-term planning process in which system engineers are responsible for monitoring, measuring and planning for aging-related effects.

The DCISC will continue to follow PG&E's progress with aging management, including review of the Generation Vulnerability Identification Team report and the Passive Device Aging Management Investigation Team report. (4.1.3)

2. The DCPP Maintenance Program appears to be functioning satisfactorily and implemented properly to meet NRC

Maintenance Rule requirements. The Maintenance organization is functionally aligned to the work scope, and the On-Line Maintenance Program is soundly PRA-based. The DCISC will follow up on Maintenance activities and on the possible effects on safety of lowered/delayed plant capital spending. (4.2.3)

3. DCPD Conduct of Operations appeared satisfactory, including outage activities; Control Room policies and demeanor, and priorities; and preparation and implementation of the Improved Technical Specifications. The DCISC will continue to review this area as part of its normal activities. (4.3.3)
4. It appeared that DCPD has performed well in its emergency drills and exercises and has been working on improving its communication of accurate and understandable radiation release information to the public. The DCISC plans to follow this item. (4.4.3)
5. The PG&E engineering programs, including Configuration Management and Equipment Qualification, continue to be satisfactory for supporting safe operations at DCPD. (4.5.3)
6. Although DCPD has methods to track performance and work load of ARs and AEs and System Engineers, they do not appear to have a method for tracking work that is not covered by either ARs or AEs nor to identify the entire Engineering Workload to determine if they have enough resources to perform the work without getting behind. (4.5.3)

The DCISC will continue to monitor PG&E's engineering performance, including workload management and a review of the results of the new Generation Vulnerability Identification Team report following its release in June 2001.

7. PG&E appears to have taken appropriate actions in response to plant off-normal operating events and system and equipment problems during this period and has applied appropriate corrective actions to prevent recurrence. The DCISC will continue to review this area as part of its normal activities. (4.6.3)

8. The DCPD Corrective Action Program (CAP) appears to have been improved as a result of self-assessments, external evaluations and reviews of other plant CAPs. Measures of program effectiveness were just being developed and appeared headed in the right direction. The DCISC will review the CAP in early 2002, following completion of improvement action items and the next self-assessment. (4.6.3)
9. DCPD environmental performance appeared satisfactory, and the DCPD environmental program appeared to meet applicable requirements. The DCISC will continue to review the environmental program as part of its normal activities. (4.7.3)
10. Based on satisfactory DCISC and NRC reviews and inspections in the previous reporting period, the DCISC did not review fire protection in the current reporting period. A DCISC review of fire protection is planned for the next period. (4.8.3)
11. The Human Performance Program is doing an adequate job of error trending, evaluating the data, and working toward increasing performance and enhancing safety. Human error continues to be the largest cause of problems, and, although the numbers of human errors are small, the trends are not yet showing sustained improvement. The DCISC will continue to actively review human performance at DCPD. (4.9.3)
12. The DCPD Employee Assistance Program appears to be well utilized, and is carrying out its responsibilities appropriately. The DCISC will review this area as part of its normal activities. (4.9.3)
13. Operator fitness continues to be an issue of concern, which the DCISC will continue to track. Indicators point to a growing problem with operator fitness, and it was not apparent that DCPD had measures in place to deal with the problem. (4.9.3)
14. PG&E appears to be handling fuel or fuel-related problems appropriately. The DCPD Unit 1 core has been reliable and clean; however, Unit 2 has experienced a small amount of fuel damage due to baffle jetting and debris or a fuel defect. The assembly was removed, repaired and returned to

the reactor. It appears PG&E will maintain its 19-21 month fuel cycle or move to an 18-month cycle. (4.10.3)

The DCISC will continue to follow on-going problems such as expansion of spent fuel storage, spent fuel pool poison (Boraflex), and any fuel-related fuel problems or issues that arise.

15. Nuclear safety oversight and review functions and organizations appear to be functioning satisfactorily at DCPD. It also appears to be very beneficial to have the joint PNAC/NSOC meetings, since each committee covers much of the same agenda. The results of the 2001 INPO evaluation appear to be favorable. The DCISC will continue to monitor the PNAC and NSOC meetings to observe their review of plant safety issues. (4.11.3)

The DCISC observed that although there was constructive and helpful dialogue during the NSOC meetings, there were limited challenges to existing thinking and processes. (4.11.3)

16. It appears that the Integrated Assessment Report is a positive tool for management's use to assess the overall performance of the plant. It combines all of the information from the various reports on the plant performance into one very useful document. The DCISC will continue to review the Integrated Assessment Report. (4.11.3)
17. It appears that PG&E managed the 1R10 and 2R10 outages very effectively to achieve the best outages at DCPD in all measures except cost and schedule. DCISC will continue to review the performance of each refueling outage. (4.12.3)
18. Although no specific reviews were made of DCPD overtime activities, there did not appear to be any problems. The DCISC will remain sensitive to overtime problems. (4.13.3)
19. As in past years, the DCISC concludes that the quality program and self-assessment program have been effective in identifying strengths and weaknesses of the activities at DCPD and bringing about effective corrective action. It appears that the NQS group is doing a good job in monitoring the top quality problems and bringing them to the attention of line management. The DCISC will continue

to review DCPD quality programs as part of its normal activities. (4.14.3)

20. The DCPD radiation protection program for controlling radiation doses inside and outside the plant appears effective overall. DCPD had experienced unusually high radiation dose rates during Outage 1R9 but had effectively reduced those levels in three subsequent outages. The DCISC will closely follow radiation protection during future outages. (4.15.3)
21. Overall, PG&E's risk assessment and risk management programs appear to be effective in supporting safe plant operation. The PRA Group has become pro-active and effective in supporting station decisions with risk-based analyses. The DCISC will continue to review risk management activities as part of its normal activities. (4.16.3)
22. PG&E's actions to improve its safety conscious work environment appear satisfactory. A cultural survey concluded that the safety culture was satisfactory and about average for the industry; however, some employees are reluctant to bring concerns to management. PG&E has an action plan to address these findings, and the DCISC will monitor these actions. (4.17.3)
23. PG&E's Steam Generator (SG) program appears effective. PG&E now expects that the DCPD steam generators will last the currently-licensed life of the plant, if the NRC approves the PG&E License Amendment Requests for Alternate Repair Criteria; however, economic considerations may call for early steam generator replacement. The DCISC will continue to closely monitor DCPD steam generator performance. (4.18.3)
24. PG&E appears to have taken appropriate action in addressing system and equipment performance issues; however as noted in several instances, the DCISC believes additional work is needed and has provided recommendations accordingly. The DCISC will continue to review this area as part of its normal activities. (4.19.3)
25. The DCPD training and development programs appeared satisfactory, and the DCISC will continue to monitor them. (4.20.3)
26. It appears that the Five-Year Business Plan is helpful in

aligning the department and plant goals and objectives. Also, the hierarchy of DCPD performance plans represented an effective method of disseminating management expectations to the whole organization. Nuclear safety was appropriately addressed. The DCISC will follow up periodically to assess how effectively the plans are being implemented. (4.21.3)

## 9.2 Concerns

There are some concerns, which the DCISC believes PG&E needs to address in order to ensure continued and improved safe operation. The more significant general DCISC concerns are listed below.

1. Human error continues to be the largest cause of problems, and, although the numbers of human errors are small, the trends are not yet showing sustained improvement. The DCISC will continue to actively review human performance at DCPD.
2. DCPD operators continue to age, and fitness levels appear to be declining, but PG&E does not have an active program to address the situation.
3. The potential impacts of bankruptcy need to be followed.
4. A recent study for NRC confirms the general experience that periods of rapid change and stress can have an adverse effect on the performance of organizations. DCPD has and continues to undergo major changes, including reorganization focusing on processes rather than functions. In addition, employees are understandably stressed by major changes underway in the industry and the PG&E filing for bankruptcy. DCPD recognizes these and has been taking steps to assure that they don't affect safe, reliable operation; however, the DCISC will continue to look for any adverse effects.

## 9.3 Recommendations

There are nine new recommendations regarding PG&E actions, which DCISC believes, are prudent for continued and improved safe operation. The specific recommendations are stated and highlighted in bold type in the various sections of this report. These recommendations are repeated below in order of

appearance in the report, and references to the report sections are shown.

- R01-1      It is recommended that DCPD develop and implement a method to identify and monitor the entire Engineering Work Load to assure that the necessary work is performed to effectively support safe operation of the plant and to help in ensuring adequate engineering resources are available. (4.5.3)
- R01-2      Because the predominant cause of events is human error, it is recommended that DCPD more closely coordinate the Corrective Action and Human Performance Programs and utilize training in human characteristics and skills (e.g., interviewing skills, human error characteristics) for personnel preparing root cause analyses and corrective actions. (4.9.3)
- R01-3      It is recommended that PG&E continue to augment its programs for operator health and aging to consider such areas as operator "aging management", physical fitness, and mental alertness on shift to further improve operator human performance. (4.9.3)
- R01-4      It is recommended that PG&E management raise its expectations of the Nuclear Safety Oversight Committee internal and external members to take a more aggressive stance in challenging problem solving and the status quo. Additionally, PG&E should consider adding independent external members (not just from STARS plants). (4.11.3)
- R01-5      It is recommended that NSOC take a more active role in determining the scope of the biennial audit of NQS to give the audit more independence. The DCISC had made a similar recommendation in the previous Annual Report and requests that PG&E reconsider its response of having NSOC only review the audit plan. (4.14.3)
- R01-6      It is recommended that PG&E take the initiative in dealing with staffing issues by developing a long-term staffing plan. (4.17.3)

- R01-7      It is recommended that PG&E take actions necessary to improve the employees' perception of the Employee Concerns Program. (4.17.3)
- R01-8      It is recommended that PG&E apply the normally used Corrective Action Program, Human Performance Program, and System Long Term Plan Program (and possibly others) to Security Services and develop an implementation plan. (4.19.3)
- R01-9      It is recommended that PG&E develop a plan for how System Health Reports and Long Term Plans should be utilized by Operations and Maintenance. (4.19.3)

The DCISC has also reviewed and considered issues raised by members of the public and has responded to or is investigating them. The DCISC finds that no issues have been raised by the public during this reporting period that would cause additional reviews or actions other than those DCISC has in place. There has been limited public interest and input at the three DCISC public meetings, with the toll-free DCISC phone line or in correspondence received by the DCISC Members. The DCISC will continue its efforts to more fully involve the public.

Finally, the DCISC appreciates PG&E's cooperation in arranging and providing information for DCISC fact-finding meetings and tours at its Headquarters and DCPD and for the professional, high quality presentations at DCISC meetings.



## 10.0 PG&E RESPONSE

(This section is reserved for PG&E's response to the DCISC annual report).

DIABLO CANYON  
INDEPENDENT SAFETY COMMITTEE  
  
ELEVENTH ANNUAL REPORT  
ON THE  
SAFETY OF  
DIABLO CANYON NUCLEAR POWER PLANT OPERATIONS

July 1, 2000 - June 30, 2001

Volume II – EXHIBITS

Philip R. Clark, Chair\*  
E. Gail de Planque, Vice-Chair\*  
A. David Rossin

\*for the period July 1, 2000 - June 30, 2001

Approved: October 17, 2001

The DCISC invites questions and comments on this report.  
Contact the DCISC at the following:

**The Diablo Canyon Independent Safety Committee**

857 Cass St., Suite D Monterey, CA 93940

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**THE DIABLO CANYON INDEPENDENT SAFETY COMMITTEE**

NOTICE IS HEREBY GIVEN that on September 14 and 15, 2000, at The Cliffs at Shell Beach Conference Center, 2757 Shell Beach Road, Shell Beach, California, a public meeting will be held by the Diablo Canyon Independent Safety Committee (DCISC), in four separate sessions, at the times indicated, to consider the following matters:

1. **Morning Session - (9/14/2000) - 9:00 A.M.** Opening comments, approve minutes of June 7-8, 2000 meeting; discussion of administrative matters including the review and approval of the DCISC Annual Report on Safety of Diablo Canyon Operations for the period July 1, 1999 - June 30, 2000; open items on the DCISC issues list; an update on financial matters and DCISC future plans; Committee member and staff-consultant reports; receive, approve and authorize transmittal of fact-finding reports to PG&E; Committee correspondence; and receive public comments and communications to the Committee.

2. **Afternoon Session - (9/14/2000) - 2:00 P.M.:** Comments by Committee members; consider technical presentations from PG&E on topics relating to plant safety and operations including implementation of the Diablo Canyon Self-Assessment Program, a discussion of the plans for Unit 1's tenth refueling outage(1R10) and a report on the radiation exposure management program for 1R10; and receive public comments and communications to the Committee.

3. **Evening Session - (9/14/2000) - 5:30 P.M.:** Consideration of further technical presentations from PG&E on topics relating to plant safety and operations including an update on plant performance and operational status, a review of the DCISC selected performance indicators, an update on the activities of PG&E's Nuclear Safety Oversight Committee, a review of Reportable Events and NRC Notices of Violation; and receive public comments and communications to the Committee.

4. **Morning Session - (9/15/2000) - 8:00 A.M.:** Introductory comments; consideration of further technical presentations from PG&E on topics relating to plant operations including an overview of the Training Program, a presentation on the 1999 Biennial Nuclear Quality Services audit and self-assessment, an overview of the Integrated Assessment Program, discussion of tracking and trending of non-cited violations and a report on the transition to improved Technical Specifications; receive public comments and communication to

the Committee; and wrap-up discussion by Committee members and the scheduling of future site visits, study sessions and meetings.

The specific meeting agenda and the staff reports and materials regarding the above meeting agenda items will be available for public review commencing Monday, September 11, 2000, at the NRC Public Document Room of the Cal Poly Library in San Luis Obispo or on the Committee's website at [www.dcisc.org](http://www.dcisc.org). **For further information regarding the public meetings, please contact Robert Wellington, Committee Legal Counsel, 857 Cass Street, Suite D, Monterey, California, 93940; telephone: 1-800-439-4688.**

Dated: August 29, 2000

**DIABLO CANYON**  
**INDEPENDENT SAFETY COMMITTEE**

Committee Members: Philip R. Clark  
E. Gail de Planque  
A. David Rossin

\* \* \* \* \*

**AGENDA**

Thursday & Friday	The Cliffs at Shell Beach
September 14-15, 2000	Conference Center
Shell Beach, California	2757 Shell Beach Road

**Morning Session - 9/14/2000 - 9:00 A.M.**

- I. CALL TO ORDER - ROLL CALL
- II. INTRODUCTIONS
- III. CONSENT AGENDA (Routine items which the Committee can approve with a single motion and vote. A member may request that any item be placed on the regular agenda for separate consideration.)
  - A. Minutes of June 7-8, 2000 Meetings: Approve
- IV. ACTION ITEMS
  - A. DCISC Annual Report on Safety of Diablo Canyon Operations;  
July 1, 1999 - June 30, 2000 Discussion/Action
  - B. Update on Financial and Budgetary Matters and DCISC Activities During 2000 Discussion/Action
  - C. Nomination and Election of DCISC Vice-Chair for the  
July 1, 2000 - June 30, 2001 Term Action
  - D. Approval of Consultant Contract:  
William E. Kastenberg Action
  - E. Update on DCISC Web Site Discussion
  - F. Timeliness of Fact-Finding Reports & Public Meeting Transcript Discussion/Direction
  - G. Resolution of Appreciation and Commendation - William E. Kastenberg Approve
- V. COMMITTEE MEMBER REPORTS AND DISCUSSION
  - A. Site visits and Other Committee Activities

B. Documents Provided to the Committee

VI. STAFF-CONSULTANT REPORTS

- A. Ferman Wardell:  
Review of Open Items List;  
Annual Report and Fact-finding topics
- B. Jim E. Booker:  
Fact-finding topics and reports
- C. Dr. Hyla Cass:  
Human performance issues
- D. Robert Wellington:  
Administrative and legal matters

VII. COMMITTEE FACT-FINDING REPORTS:  
Receive, approve and authorize transmittal to PG&E

VIII. CORRESPONDENCE

IX. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)

X. ADJOURN MORNING MEETING

Afternoon Session - 9/14/2000 - 2:00 P.M.

XI. RECONVENE FOR AFTERNOON MEETING

XII. COMMITTEE MEMBER COMMENTS

XIII. INFORMATION ITEMS BEFORE THE COMMITTEE

- A. Technical Presentations Requested by the Committee of P.G. & E. Representatives:
  - 1) General Introductions
  - 2) Implementation of the Self-Assessment Program
  - 3) Overall Plans for Unit 1's Tenth Refueling Outage
  - 4) Management of Radiation Exposure During Unit 1's Tenth Refueling Outage

XIV. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)



XV. ADJOURN AFTERNOON MEETING

Evening Session - 9/14/2000 - 5:00 P.M.

XVI. RECONVENE FOR EVENING MEETING

XVII. COMMITTEE MEMBER COMMENTS

XVIII. INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)

- 5) Update on Plant Performance, Plant Events and Operational Status
- 6) Review of Selected Performance Indicators
- 7) Activities of PG&E's Nuclear Safety Oversight Committee and President's Nuclear Advisory Committee
- 8) Review of Reportable Events and NRC Notices of Violation

XIX. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)

XX. ADJOURN EVENING MEETING

Morning Session - 9/15/2000 - 8:00 A.M.

XXI. RECONVENE FOR MORNING MEETING

XXII. INTRODUCTORY COMMENTS

XXIII. INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)

- 9) Overview of the Training Program
- 10) Results of the 1999 Biennial Nuclear Quality Services Audit and Self-Assessment
- 11) Overview of the Integrated Assessment Program
- 12) Review of Tracking and Trending Results for Non-Cited Violations
- 13) Report on the Transition to Improved Technical Specifications

XXIV. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)

XXV. CONCLUDING REMARKS AND DISCUSSION BY COMMITTEE MEMBERS

- A. Future Actions by the Committee
- B. Further Information to Obtain/Review
- C. Scheduling of Future Site Visits,  
Study Sessions and Meetings

XXVI. ADJOURNMENT OF THIRTY-FIRST SET OF MEETINGS.

M I N U T E S  
of the  
SEPTEMBER 2000 MEETINGS  
OF THE  
DIABLO CANYON INDEPENDENT SAFETY COMMITTEE

Thursday & Friday  
September 14-15, 2000  
Shell Beach, California

Notice of Meeting

A legal Notice of Meeting was published in local newspapers, along with several display advertisements, and was mailed to the media and those persons on the Committee's service list.

Agenda

**I      CALL TO ORDER - ROLL CALL**

The September 14, 2000 meeting of the Diablo Canyon Independent Safety Committee (DCISC) was called to order by Committee Chair Philip Clark at 9:00 A.M. at the Cliffs at Shell Beach Conference Center in Shell Beach, California. Roll call was taken.

Present:            Committee Chair Philip Clark  
                     Committee Member E. Gail de Planque  
                     Committee Member A. David Rossin  
Absent:             None

**II      INTRODUCTIONS**

The Chair observed that this was Dr. Rossin's first meeting as a new Member of the Committee and welcomed him. Mr. Clark introduced the Committee's consultants and Legal Counsel in attendance at the meeting. Present were Consultants Booker, Wardell and Dr. Cass and Legal Counsel Wellington.

**III     CONSENT AGENDA**

The Chair requested Mr. Wellington to introduce the only item from the Consent Agenda, a routine item which the Committee could approve by vote or on motion of a member remove to the regular agenda. That item was approval of the

Minutes of the public meeting held by the DCISC on June 7-8, 2000. Some minor editorial corrections and clarifications were noted and upon a motion made by Dr. de Planque, seconded by Dr. Rossin, those Minutes were unanimously approved as amended.

#### Committee Business

#### **IV ACTION ITEMS**

A. DCISC Annual Report on Safety of Diablo Canyon Operations; July 1, 1999 - June 30, 2000. The Chair requested Consultant Wardell to review the latest draft of the Committee's 1999-2000 Annual Report on Safety of Diablo Canyon Operations, two earlier drafts having been circulated and comments received and incorporated into the latest draft. The Chair led a review of the latest draft of the Executive Summary section of the Report and each of the Committee's Conclusions, Concerns and Recommendations. A copy of the Executive Summary was included in the public agenda packet for this meeting. PG&E Senior Vice President Greg Rueger provided information to the Members during their discussion. Members and consultants discussed the content of several sections of the Report which expressed the Committee's Conclusions and offered suggested changes to certain sections including those concerning the Radiation Protection and Steam Generator Programs. The Members and consultants discussed the sections containing the Committee's Concerns with Mr. Rueger and Mr. Stan Ketelsen of PG&E's Regulatory Services organization. Members and consultants had several questions and requested clarification concerning certain of the Concerns contained in the draft Report from the PG&E representatives present. The Committee Members then briefly reviewed and discussed the basis for each of their Recommendations as contained in the current draft of the Annual Report. Members and consultants agreed to provide Mr. Wardell with all of their final comments and suggestions for the final version of their 1999-2000 Annual Report. That final version will be prepared by Mr. Wardell and will incorporate those comments and suggestions adopted by the Members during this meeting as well as those received from former DCISC Member Dr. William Kastenberg who was a serving Member of the Committee during this Annual Report period.

The Members and consultants discussed with Mr. Rueger and Mr. Ketelsen the procedure for PG&E to receive, review and respond to the 1999-2000 DCISC Annual Report. PG&E's response

will then be included within the final Report. **Opportunity for further questions and clarification, if necessary, of the Annual Report will be scheduled during a future fact-finding meeting with PG&E representatives.**

The Chair expressed the Committee's appreciation and thanks to Consultant Wardell for all his efforts in coordinating and assembling the Annual Report.

B. Update on Financial & Budgetary Matters. Legal Counsel Wellington reviewed with the Members some financial information received from the Committee's accountants. Members reviewed and discussed planned activities by the DCISC for the remainder of this calendar year. Consultant Wardell noted that there are presently three fact-findings scheduled with PG&E for the rest of 2000, during October, November and December, and the Members discussed their respective schedules to determine their availability to attend these fact-findings. **The Chair requested a revised and simplified monthly budget summary be prepared by the Committee's accountants and made available to the Members to better enable them to monitor the Committee's financial status.** Following a review of the current budget and resources on hand, it was determined that the Committee's current budget appears adequate at present to fund the Committee's remaining activities for calendar year 2000, and to maintain a sufficient contingent reserve.

A short break followed.

C. Nomination and Election of DCISC Vice-Chair for the July 1, 2000 - June 30, 2001 Term. The Chair noted that Dr. Kastenberg had been duly elected DCISC Vice-Chair for the current term, however, as his appointment to the Committee has lapsed and he is no longer serving as a Member, it was therefore appropriate to select a Member to serve as Vice-Chair. Upon nomination by Dr. Rossin, seconded by Mr. Clark, Dr. de Planque was elected to the office of DCISC Vice-Chair for the term July 1, 2000 through June 30, 2001.

D. Approval of Consultant Contract:  
Dr. William E. Kastenberg. Members briefly reviewed the scope of services for a proposed consulting agreement with former DCISC Member Dr. Kastenberg to provide for his review of the 1999-2000 Annual Report. Upon a motion made by Dr. de Planque, seconded by Dr. Rossin, that contract was approved by the Committee.

E. Update on DCISC Web Site. Legal Counsel Wellington briefly reviewed the content and components of the Committee's new world-wide-web site and he discussed with Mr. Ketelsen procedures to refer, as appropriate inquiries concerning Diablo Canyon Power Plant (DCPP) to Mr. Ketelsen or to the PG&E or the NRC websites as appropriate.

F. Timeliness of Fact-Finding Reports & Public Meeting Transcripts. Committee Members discussed with the consultants a schedule for the preparation, completion and review of the written reports which are prepared by the consultants following every fact-finding meeting. **The Members directed that these reports should be prepared by the consultant attending the fact-finding and made available for the review and comments of all Members within four to eight weeks after the fact-finding and that all pending reports should be closed out prior to or during the next public meeting of the Committee. Mr. Wellington remarked that the transcript of the discussion at the Committee's public meetings could be produced and available for review within forty-five days of the public meeting. The transcript would then be sent to PG&E with a request that, if they chose to provide any comment or revisions, these be provided to the DCISC within thirty days. The Committee will continue to file its public meeting transcripts with the NRC Public Document Room at the R.E. Kennedy Library at California Polytechnic University in San Luis Obispo. The Committee further directed that minutes of their public meetings prepared from the transcripts be available for review by the Members, consultants and PG&E at least two weeks prior to the next scheduled public meeting.**

G. Resolution of Appreciation and Commendation - Dr. William E. Kastenberg. Following the Committee Members review and approval of the content of their Resolution and upon a motion of Dr. de Planque, seconded by Dr. Rossin, the Committee Members unanimously adopted a Resolution of the Diablo Canyon Independent Safety Committee thanking and commending Dr. William E. Kastenberg for his service on the Committee since its inception.

H. PG&E's pending Application before the California Public Utilities Commission (CPUC). At the request of the Chair, Mr. Rueger discussed PG&E's pending Application before the CPUC and the potential effect on the continued existence of the DCISC should the CPUC grant the Application

as submitted. Mr. Rueger stated that PG&E's Application contains a request that the transition period to a deregulated market for electric power in California be terminated. He briefly reviewed the terms of the present CPUC Settlement Agreement which provides for profits from DCPD operations to be shared on a fifty-fifty basis with PG&E's customers. PG&E's June 30, 2000 Application addresses certain areas of the Settlement Agreement and Mr. Rueger briefly discussed some of the provisions which will require further clarification. He stated that three groups, the DCISC, the CPUC's Office of Ratepayer Advocates (ORA) and the group Towards Utility Rate Normalization (TURN) have filed comments with the CPUC concerning PG&E's Application and Mr. Rueger reported that this matter is now pending before the CPUC.

The Chair referred to the Response by the DCISC to the PG&E Application and remarked that, while the Committee's Response does not advocate continuing the Committee in existence, the Committee believes that, as the DCISC was established through an express provision of a decision by the CPUC, any future action by the CPUC which would disestablish the DCISC should be unambiguous. Mr. Clark stated that the Committee and its Members should be available and prepared to address questions from any of the parties or their appointing entities. **The Committee then approved and requested Legal Counsel Wellington to attend the pre-hearing conference with the CPUC to observe, respond to questions and to report back to the Members concerning any actions taken or schedule for further consideration adopted by the CPUC.**

#### V COMMITTEE MEMBER REPORTS AND DISCUSSION

a) Site Visits and Other Committee Activities: Dr. de Planque and DCISC Legal Counsel Wellington reported on meetings they attended on June 9, 2000, with representatives of the California Attorney General and the California Energy Commission in Sacramento, and they briefly reviewed some of the topics discussed which included: the content of the current DCISC Open Items List, the agenda for the June 2000 public meeting, proposed revisions to the NRC's safety oversight function, final resolution of a recent employment discrimination case involving a DCPD employee and the status of the pending application by PG&E before the CPUC.

b) Documents provided to the Committee: Mr. Wellington briefly reviewed the lists of the various documents, copies of correspondence and reports provided to

the Committee by PG&E and the NRC. Copies of these lists are included in the public agenda packet for every DCISC public meeting.

## **VI STAFF-CONSULTANT REPORTS**

Consultant Wardell reviewed certain of the items on the current Open Items List which is used to track the status of those items which the DCISC has identified for follow-up, further information or future action. Mr. Wardell identified certain items which have been consolidated or closed out since the last public meeting of the DCISC in June 2000. A copy of the current Open Items List was included in the public agenda packet for this meeting.

Mr. Wardell reported on a fact-finding he attended on July 6-7, 2000, with Drs. Kastenbergh and Cass. He discussed the topics reviewed during meetings with PG&E representatives at those meetings which included: the September 22, 1999 reactor trip event due to a lightning strike in the switchyard; the DCPD lightning protection program; the status of the System Health Indicators and long-term plans for individual Plant systems; the single index NRC Maintenance Rule-based system indicator being developed to track aggregate performance of DCPD systems; an overview of environmental performance; the results of the recent audits and surveillances performed by the Nuclear Quality Services (NQS) organization; the recent efforts to resolve an issue concerning the Plant cooling water discharge with the Regional Water Quality Control Board; turbine blade cracking; the status of the DCISC-selected performance indicators and efforts to consolidate those indicators with the NRC-mandated performance indicators; Institute of Nuclear Power Operations (INPO) Significant Operating Event Reports (SOERs) 98-1 and 98-2; and the Control Room ventilation system. DCISC representatives also received reports on the fire and declaration of Unusual Event which occurred on May 15, 2000 and PG&E's efforts to resolve issues concerning communication of information concerning the Plant's status to the public during that event. Mr. Rueger and Mr. Jeff Lewis of PG&E's News Department discussed with the Members the issue of public communication during the May 15, 2000 Unusual Event and the respective roles and efforts of PG&E and the NRC in disseminating timely, accurate and useful information to the general public. **Dr. de Planque suggested, and Mr. Rueger agreed, that PG&E may want to discuss with the NRC at a future meeting those issues which concern improving communication**



with the public.

Following the Thursday afternoon technical presentation by Mr. Nugent (see page 13-15) concerning the transition to the Improved Technical Specifications, the Committee resumed consideration of consultant reports.

Consultant Booker stated that he had not participated in any fact-finding since the last public meetings of the DCISC in June 2000.

Consultant Dr. Cass reported on the fact-finding she attended on July 6-7, 2000 at DCPD to review human performance issues. She stated that the Human Performance Group reviews low-level Action Requests (ARs) using a new model now entitled the "Personnel Accountability Policy" to analyze personnel accountability and the relationship to human performance events, and she briefly reviewed the evolution of that Policy. She

reported that the principles of the Policy include identifying blameless error and associated corrective actions throughout the organization and using coaching and counseling to achieve correction rather than discipline. The Operations and Maintenance organizations at DCPD are presently perceived as those most susceptible to personnel errors and she reported that there were seven events during this past year, with an increasing trend in personnel error observed during the past three months. Dr. Cass stated that preliminary analysis has identified the need for better pre-job tailboard review conferences, rigorous feedback, improved communication and self-verification by the workforce to address the increase in personnel error. Front line workers and first line supervisors are now polled after completing a job or work order to develop an anonymous database which will be used to provide information to management as well as feedback to workers and supervisors and result in an improved work-control process. In concluding this segment of her report, Dr. Cass observed that the Human Performance Group at DCPD appears to be taking positive steps to analyze and address human errors. Tools are being developed to support the cultural changes which are occurring and to improve human performance. Dr. Cass stated that the Committee may wish to consider making a recommendation that PG&E closely interface efforts in the area of human performance with organizational development and other plant-wide efforts to develop a comprehensive and integrated program to address human error and to foster increased cross-Plant communication.

Dr. Cass reported on the recent activities of the Organizational Development Program. She stated that the Program deals with interpersonal skills in the organization including training and the facilitation of communication. She stated that a method entitled 360°Feedback is presently being used by officers, managers and directors to determine leadership behaviors and plans are under consideration to introduce this method to supervisors. This feedback method is tied to the Performance Incentive Program which provides employees with a financial incentive for their performance. Dr. Cass remarked that efforts are being made to expand the new culture and integrate the various union bargaining units and the craft organizations at DCPD into a plant-wide training dynamic to ensure all groups receive an appropriate level of training. PG&E Vice President and DCPD Plant Manager David Oatley remarked that the shift foremen and shift managers as well as some of the key individuals in the bargaining units are currently included in the officer-management-supervisor cultural meetings which focus on safety and human performance. Dr. Cass stated that DCPD is making efforts to address its future needs, in recruiting new employees as well as to retain current employees, as a significant portion of the present DCPD workforce reaches retirement age. In concluding this portion of her report, Dr. Cass observed that the Organizational Development Program appears to be comprehensive and is playing a significant role in the major cultural shift which has and is occurring at DCPD. Mr. Clark reviewed with Dr. Cass and the PG&E representatives present the ongoing efforts being made to coordinate the efforts of the Human Performance and Industrial Safety organizations.

Dr. Cass reported on her visit to the DCPD Medical Center to review the Stress Reduction Program, overall operator fitness and the efforts to enhance alertness and wakefulness of personnel working the night shifts. Dr. Cass, in response to a question from Dr. Rossin, briefly reviewed the origin of the Committee's interest in these topics and the impact of chronic stress on safety. She also discussed a program entitled Dash for Cash which is aimed at providing a financial reward to those employees who voluntarily improve their physical fitness and health. This program has been offered to DCPD personnel in the Security Department and she reviewed that Program's impact and the requirements which must be met by those security officers who carry weapons within the Plant. Dr. Cass remarked that a similar program might be effective in motivating Operations Department personnel to greater levels

of fitness. She also reviewed several other programs aimed at improving the overall health of employees.

Committee Legal Counsel Wellington reported that he had sent information to Mr. John Gagliardini, a member of the public who had addressed comments concerning the ownership of the lands underlying DCPD to the Committee Members during several of their previous public meetings. **Mr. Wellington also reported that he is continuing discussions with PG&E's Regulatory Services and Legal departments concerning an issue concerning the use of a unilateral advocate within the Employee Advocate Program.**

Following the final technical presentation on Friday afternoon by Mr. Russell Gray (see page 31-33) concerning the management of radiation exposure during refueling outage 1R10, Dr. Cass reported her attendance with Consultant Wardell at a public meeting held by the NRC on Thursday evening, September 14, 2000, in San Luis Obispo to present an overview of the NRC process to address claims of discrimination at NRC licensed facilities under the provisions of regulations contained in 10 CFR 50.7. She stated that during this presentation the NRC reviewed the significance and importance of employees feeling safe from discrimination should they chose to identify concerns regarding operational issues within a nuclear plant, without fear of retaliation, and that multiple avenues must be maintained within the work environment for workers to identify and communicate their concerns. The NRC's presentation also reviewed the anxiety which currently exists and the challenges faced by employees and management created by their changing work environment and impact of those factors on reporting safety concerns.

Dr. Cass observed that PG&E reported that 90% of the allegations reported to the NRC are ultimately determined to be unsubstantiated. The 10% of allegations which are found to be substantiated receive intense scrutiny in and by the media. Dr. Cass reported that a representative from DCPD made a presentation on the investigation and determination by the NRC that PG&E had not discriminated against one of its employees who raised safety concerns. The DCISC had been closely involved in reviewing that employee's concerns and the employee has addressed the Committee several times during its past public meetings. However, Dr. Cass reported that the Department of Labor, in their preliminary investigation, concluded that there had been discrimination by PG&E in responding to and dealing with the allegations raised by that

employee. The preliminary conclusions reached by the Department of Labor were, apparently inadvertently, released by the employee's legal representatives and that information received wide distribution in the media. Mr. Rueger commented that PG&E has since settled the matter with the individual involved; however, he remarked that the premature and one-sided release of only the Department of Labor's conclusions affected how the matter was perceived by the public at large as well as by many DCPD employees and that PG&E has discussed with the NRC the impact of that situation. He discussed with the Members attempts to better coordinate the investigatory efforts of the Department of Labor and the NRC. In response to a question from Mr. Clark, Dr. Cass stated that the discussion during the meeting was not transcribed; however, a report on the meeting will be made available electronically on the NRC website. Mr. Rueger stated that, while the NRC advertised the meeting in the local media, he was surprised by the small number of members of the public who attended. Mr. Wellington remarked that the Committee's administrative office did not receive written notice of the meeting.

## **VII COMMITTEE FACT-FINDING REPORTS**

On Thursday, the discussion of this item was deferred to the Friday's public meeting, September 15, 2000.

Following the last of the technical presentations by PG&E on Friday afternoon, the Committee returned to consideration of the July 2000 fact-finding report. Subject to the inclusion of editorial comment provided by the Members and upon motion by Dr. Rossin, seconded by Dr. de Planque, the July 2000 fact-finding report was unanimously approved for transmittal to PG&E.

## **VIII CORRESPONDENCE**

Committee Legal Counsel Wellington directed the attention of the Members to copies of the correspondence sent and received by the Committee since the last public meetings of the DCISC in June 2000.

## **IX PUBLIC COMMENTS AND COMMUNICATION**

The Chair, prior to adjourning the morning session, invited any persons present in the audience to address any comments or communications to the Committee. There was no response to this invitation.

**X        ADJOURNMENT**

The morning meeting of the Diablo Canyon Independent Safety Committee was adjourned by the Chair at 12:45 P.M.

**XI        RECONVENE FOR AFTERNOON SESSION**

The Chair convened the DCISC for its afternoon meeting at 2:00 P.M.

**XII       COMMITTEE MEMBER COMMENTS**

There were no comments from the Committee members at this time.

**XIII      INFORMATION ITEMS BEFORE THE COMMITTEE**

Senior Vice President Rueger recognized Mr. Oatley and PG&E Vice President for Power Generation and Nuclear Services Larry Womack to assist with the technical presentations to the DCISC.

Mr. Rueger introduced Mr. Steve Hiatt, DCPD Self-Assessment Coordinator, to make the first of the technical presentation requested by Committee.

**Implementation of the Self-Assessment Program.**

Mr. Hiatt began his presentation with a review of the Self-Assessment Program's history and he stated that it was a focus area for the nuclear power industry as the industry begins to move towards re-evaluating the threshold for regulation. Mr. Clark had a question concerning PG&E's perception of the NRC's direction as it alters its regulatory posture with the nuclear power industry and Mr. Rueger responded with his observations that the NRC is attempting to direct its resources toward identified areas wherein regulatory and licensee focus has been demonstrated in the past to have been the most effective. Mr. Hiatt reviewed the upgrades made to the Self-Assessment Program which include: establishment of the Self-Assessment Coordinator position to manage and direct self-assessments; issuance of a program guide for performing self-assessments, establishment of departmental coordinators for self-assessment education; and establishment of an integrated scheduling program for self-assessments. The Self-Assessment Advisory Board, chaired by

the Vice President and Plant Manager, was established to provide a critical and independent review of self-assessment results and plans. Mr. Hielt briefly discussed efforts to coordinate and integrate the Self-Assessment Program with the audits performed by NQS, INPO and the NRC to ensure that an opportunity is provided to coordinate the implementation of findings and results of self-assessments. He reported that DCPD is concentrating on increasing the Self-Assessment Program's visibility within the Plant and is increasingly making use of industry peers to participate in performing self-assessments and is using industry-wide accepted standards of excellence as Self-Assessment Program measuring tools.

This year there have been 33 self-assessments which have met the Program's standards and Mr. Hielt reported that the quality of information contained in the written reports has improved significantly. In response to a question from Dr. de Planque, Mr. Hielt replied that the writing course taught at DCPD by INPO to improve the report writing skills of personnel charged with documenting the results of the self-assessments did address incorporating industry accepted standard terminology into report findings. Mr. Hielt discussed the content and format of the self-assessment reports with the Members and he stated that one of his roles as the Program Coordinator is to review and integrate all the reports and attempt to identify common areas or trends. He reviewed the results of self-assessments performed and **Mr. Clark requested that a future Committee fact-finding be scheduled to include a review of the Self-Assessment Program and the next NQS Quality Performance and Assessment Report (QPAR).**

Mr. Hielt concluded his presentation with his observation that DCPD management's belief in the success of the Self-Assessment Program involves the communication to, and recognition and acceptance by, the line organizations and the workforce that critical or opposing views are welcome and that management remains open to criticism and suggestions. In response to a question from Mr. Clark, Mr. Oatley and Mr. Hielt responded that areas for self-assessments are generally not selected or based upon an upcoming audit by another reviewing body, but are selected based upon existing data and review of identified trends. **Mr. Clark requested that the DCISC receive a copy of the integrated schedule for the Self-Assessment Program and a copy of the most recent quarterly report for the Program.**

Mr. Rueger introduced Mr. Mike Davis, Systems Scheduling

Supervisor at DCPD for a presentation to the Committee.

Plans for Unit 1's Tenth Refueling Outage (1R10).

Mr. Davis began his presentation by reviewing the 1R10 outage scope and issues and areas identified by experiences during past outages for improvement during 1R10. The critical outage scope of activities for 1R10, which is scheduled to commence on October 8, 2000, include:

- Refueling the reactor.
- Critical valve maintenance.
- Steam generator maintenance.
- Low pressure turbine/generator inspection and maintenance.
- Low pressure C rotor replacement
- Diesel generator maintenance.
- Vital bus H maintenance.

Mr. Davis briefly discussed and responded to questions concerning each of these activities. Mr. Oatley and Mr. Womack both responded to a question from Mr. Clark concerning the qualification of the techniques used for inspection and assessment of the condition of the steam generator tubing.

Mr. Davis then reviewed the major projects and modifications to DCPD systems scheduled for 1R10, which include replacement of the Residual Heat Removal System (RHR) sump screen to increase its area; replacement of the Reactor Coolant Pump (RCP) cable on RCPs 1-1 and 1-3 due to aging; replacement of the Main Feedwater pump Lovejoy speed control system with the more modern Woodward system; and increasing Unit 1's power output rating. Mr. Davis reported that no significant risks to the reactor core are expected to occur during 1R10 and that the overall outage risk factors are approximately the same as experienced during other recent DCPD refueling outages. Mr. Davis and Mr. Oatley discussed with the Members the activities planned during the second of two mid-loop operations, when there will necessarily be only one Component Cooling Water Pump (CCWP) available because of work taking place within the 4kV switchgear room. Goals for 1R10 include achieving the personnel radiation exposure goal of  $\leq 148$  person-rem, no disabling or reportable injuries, no loss of core cooling with the core in any location, event free mid-loop operations, no significant personnel errors or equipment damage.

Mr. Davis reviewed the initiatives planned for 1R10 to improve personnel safety. These include conducting a tailboard review meeting prior to commencing any job to discuss safety risks and compensatory measures. Personnel stand-downs during which safety expectations will be discussed are to be conducted prior to 1R10 to demonstrate that attention to safe work practices remains at the highest level of management's attention. During 1R10 there will be increased in-field supervisory oversight to ensure that management's expectations are being met. He observed that the primary focus for improving human performance involves the Maintenance, Operations and Chemistry/Radiation Protection organizations and emphasis will be placed upon self-verification techniques, closed-loop communication, tailboards and adherence to standards and expectations. Emphasis will also be placed on personal accountability with in-field supervisory oversight and use of human performance communication and culpability tools.

Concerning the outage duration and cost goals, Mr. Davis reported that PG&E currently hopes to achieve 1R10 in 30 days or less and at a cost of \$30 million or less. The present projected duration is 26 days 3 hours, while DCP's previous best outage performance during 2R9 was 31 days 18 hours. He identified pre-outage preparation; improved schedule review; fewer projects, with no failed fuel or fuel repairs scheduled; incorporation of lessons learned in Main Feedwater Pump speed control replacement; no reactor vessel surveillance specimen removal required; and the co-location of Operations and Outage Management organizations as significant contributors to the projected short duration. Mr. Davis and Mr. Womack briefly discussed with Dr. Rossin some of the contingencies possible in the event that fuel damage was discovered or occurred during core off-load. The PG&E representatives then reviewed the pre-outage preparation schedule which is developed to attempt to preclude unforeseen issues arising just prior to an outage, and Mr. Davis reviewed the critical path schedule for 1R10. Members had several questions concerning the availability of radiation protection technicians for 1R10 to which Mr. Davis and Mr. Oatley both responded.

A short break followed this presentation.

Mr. Rueger introduced the Licensing Supervisor for Regulatory Services at DCP, Mr. Pat Nugent, to make the next presentation to the Committee.



## Report on the Transition to Improved Technical Specifications.

Mr. Nugent stated that the program to transition DCPD to the Improved Technical Specifications (ITS) has recently been completed. He stated that the ITS were developed beginning in 1995, with DCPD working in conjunction with the Wolf Creek, Callaway and Comanche Peak nuclear plants which partnered with DCPD in that effort. The Licensee Amendment Request (LAR) was submitted in June 1997, and all Plants received and responded to requests for additional information. The NRC issued the License Amendment (LA) for the ITS in May 1999. In response to a question from Mr. Clark, Mr. Nugent replied that the new set of technical specifications (TS) themselves are somewhat less lengthy than before; however, the basis for the TS have expanded considerably. He remarked that implementation of the ITS was originally scheduled for the end of May 2000. However, that date was later changed and an emergency LAR submitted to permit postponement of implementation of the ITS until the end of June 2000 due to PG&E's concern over implementing the ITS during the restart of both Units because of the 12kV bus outage which had occurred.

An ITS Implementation Project Manager position was created and a Team was formed to identify all required changes resulting from the ITS which included members from the Surveillance Test, Operations, Engineering, Licensing, Instrumentation and Control Procedures, Administrative Procedures and Final Safety Analysis Report (FSAR) organizations. Mr. Nugent reviewed the number, scope, complexity and volume of major and minor changes and revisions made to various documentation and the changes and additions to programs and test procedures which required the attention of and review by the Team.

DCPD submitted a clean-up LAR to the NRC during March 2000 which addressed the changes resulting from the Implementation Program for the ITS, and a Management Oversight Team was formed to monitor progress of the Implementation Program. Work curves were created using the projections developed by various organizations and these were reviewed frequently to assure that sufficient resources were available to meet goals. Mr. Nugent stated that this effort was based in part upon the successful Y2K Program. A self-assessment of the Implementation Program was performed in April 2000, utilizing personnel from DCPD's Licensing and Quality Assurance organizations as well as personnel from Wolf Creek,

Callaway and Comanche Peak Plants. This self-assessment identified enhancements to the implementation efforts but no major issues were found which would hamper the process.

Mr. Nugent reviewed the comprehensive efforts made to adequately train the licensed operators and other necessary DCPD personnel on the ITS. These efforts included a detailed review of TS rules of usage and all the changes made to the TS, which were illustrated by comparing the current TS with the ITS. In response to a question from Mr. Clark, Mr. Nugent reviewed the emphasis placed upon what he termed the rules of usage for the TS which provide guidance for the actual application of the TS.

Mr. Nugent reviewed the results of the Implementation Program which have been measured in terms of the absence of requests by DCPD for enforcement discretion of any LARs from the NRC, which might have been necessary to address problems experienced with the ITS. The Implementation Program was completed as scheduled. He identified some of the lessons learned during the ITS Implementation Program which include some unanticipated ramifications resulting from their application to the Containment Isolation Valve requirements of when to apply administrative controls to open valves. Personnel have been asking questions of the Implementation Team to clarify issues; however, there have been no errors reported or identified to date from the application of the ITS. He stated that there have been some instances where a TS, or a portion of a TS, has been relocated to the FSAR or to the Equipment Control Guidelines (ECG) to address a specific licensing commitment, a surveillance requirement or to better define operability criteria for a system. He described the ECGs as a form of administrative TS which may be altered without prior NRC approval under the provisions of 10 CFR 50.59.

In concluding his presentation, Mr. Nugent remarked that the Implementation Program for ITS was a huge effort for DCPD and it involved thousands of procedures, hundreds of individuals and required strict project management coordination. The success of the Implementation Program demonstrated the feasibility of working jointly with other utilities and this resulted in a better product.

Committee Members had questions for Mr. Nugent following his presentation concerning the value to DCPD of such a comprehensive industry-wide effort to make the change to ITS.

Mr. Nugent, Mr. Oatley and Mr. Rueger reviewed the NRC's rationale for implementing the joint ITS rather than continuing to deal with TS changes only on a plant-specific basis. Mr. Womack reviewed the evolution of the development of TS since the mid-1970's and he stated that this latest effort by the industry represents the first real action to consolidate or truly standardize the basis and the underlying assumptions for the limits in the TS and to make them consistent. The PG&E representatives discussed and commented upon the savings in time and cost, and the advantage to scheduling, which resulted from working together with the other utilities to develop the ITS and the savings to the NRC in terms of its review efforts. In response to a question from Mr. Clark, Mr. Oatley responded that the operators are now accustomed to the new ITS and, in general, have approved of the better understanding afforded by the articulated bases now incorporated within the ITS. In response to a question from Consultant Booker, Mr. Nugent confirmed that the other plants which participated with DCCP in developing the ITS will also be cooperating on changes as they become necessary.

Following Mr. Nugent's presentation, the Committee returned to consideration of its consultants' reports under Section VI of the agenda, as reported above.

#### **XIV PUBLIC COMMENTS AND COMMUNICATIONS**

The Chair, prior to adjourning the afternoon session, invited any persons present in the audience to address any comments or communications to the Committee. There was no response to this invitation.

#### **XV ADJOURN AFTERNOON MEETING**

The afternoon meeting of the Diablo Canyon Independent Safety Committee was adjourned by the Chair at 4:45 P.M.

#### **XVI RECONVENE FOR EVENING MEETING**

Mr. Clark called to order the evening public meeting of the DCISC at 5:00 P.M.

#### **XVII COMMITTEE MEMBER COMMENTS**

The Chair introduced the Members and consultants present and requested PG&E Senior Vice President Rueger to

continue with the technical presentations to the Committee.

#### **XVIII INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)**

Mr. Rueger requested Mr. Oatley to make a presentation to the Committee concerning overall Plant performance and operational events since the last public meeting of the DCISC in June 2000.

##### **Update on Plant Performance, Plant Events and Operational Status.**

Mr. Oatley began by reviewing the events and accomplishments at DCPD since the last public meeting of the DCISC. These have included hosting an INPO Plant Evaluation Training Team during May 2000, reaching a tentative agreement in June with the California Regional Water Quality Board concerning all issues regarding DCPD's ocean cooling water discharge permit, achieving implementation of the ITS during June, and the successful completion during August of an intensive three-week NRC assessment of the Auxiliary Saltwater (ASW) and 4 kV Systems. A review was also conducted of corrective actions taken or planned due to a "white" status for the NRC Performance Indicator for loss of normal heat sink because of kelp loading at the Intake Structure.

Mr. Oatley reviewed generation performance for both Units. For Unit 1(U-1), year-to-date, the operating capacity factor is presently 93.72%. Mr. Oatley briefly reviewed the events, both planned events and forced outages, which have impacted U-1's performance. For Unit 2 (U-2) the year-to-date operating capacity factor is presently 100.17% and events impacting U-2 were briefly reviewed by Mr. Oatley. He reported that U-2 has experienced some minor fuel failure, which were characterized as tight defects associated with two or three rods, following the 2R9 refueling outage in September-October 1999.

Mr. Oatley reviewed PG&E's recent decision to accept a ten- day forced outage for U-2 due to the catastrophic disintegration of a metal bellows which connects fixed piping to the underside of the Turbine and he discussed with the Committee the rationale for the decision to shut down U-2 and repair the failed bellows and some of the other bellows which were found to be cracked. The failure of the bellows resulted in debris being deposited within the condenser and this might have been damaging to condenser tubing. The

bellows' age was determined to have been the cause of the failure and Mr. Oatley reported that three other plants have also experienced forced outages due to this problem. Mr. Clark asked a question concerning PG&E's past evaluation of the bellows and the decision to try to keep U-2 operating until the serious nature of the failure became apparent. Mr. Rueger responded that there were several reasons for PG&E to try to keep U-2 operating after the damage to the bellows was initially suspected, including a lack of indication of the serious extent and potential impact of the failure and the fact that the other bellows were not believed to be damaged. Mr. Rueger observed that PG&E recognized that an unplanned outage would have to be scheduled to address the bellows failure but that PG&E wished to avoid, if possible, any conflict with scheduled refueling outage 1R10 while continuing to monitor for salt leakage from the condenser and to evaluate the performance of U-2 and to take time to plan for the necessary forced outage. Mr. Oatley remarked that PG&E was in contact with the condenser's manufacturer, Westinghouse, and that Westinghouse did not indicate their concern in U-2 continuing operation for one week.

During U-2's forced outage, 7 of a total of 27 metal bellows were replaced and plans are to replace the remainder during U-2's next refueling outage (2R10) scheduled for May 2001. U-1 will have all its metal bellows replaced during 1R10 during October 2000. In response to a question from Mr. Clark, Mr. Oatley and Mr. Rueger responded that U-2's unplanned forced outage probably did have a detrimental effect on the NRC Performance Indicators for DCPD in a manner different than had the forced outage taken place one week later, although both PG&E representatives stated that this did not impact in any way the initial decision to attempt to continue U-2 in operation. Mr. Oatley remarked that he has recently sent a letter to all DCPD Operations personnel stating that neither any possible impact on the NRC Performance Indicators nor the current condition of the California electrical grid system should be considered in any context whatsoever when making operational decisions.

#### **Review of Selected Performance Indicators.**

Mr. Rueger briefly discussed and reviewed with the Members and consultants the 23 indicators currently being tracked by PG&E for the DCISC to measure DCPD performance, the goals presently established for those indicators and their performance as measured to date. He summarized their status,

through the end of August 2000, as follows (↑ indicates an improving trend, ↓ indicates a declining trend and → indicates a steady performance since that indicator was last reported to the Committee):

Eleven of the indicators are on or better than the target:

- ↑ Personnel contamination incidents.
- ↑ Non-outage corrective maintenance backlog.
- ↑ Operating Experience Assessment (OEA) backlog.
- ↓ Quality problem completion.
- Event-free days.
- U-2 operating capacity factor.
- Unplanned reportable releases.
- U-1 primary system chemistry index.
- U-2 primary system chemistry index.
- U-1 secondary system chemistry index.
- U-2 secondary system chemistry index.

Three of the indicators are close to meeting expectations:

- ↓ Radiation exposure.
- ↓ Meeting corrective maintenance due dates.
- ↓ U-1 operating capacity factor.

Three of the indicators are clearly not meeting expectations:

- ↑ Industrial safety.
- ↓ Unplanned automatic reactor trips.
- ↓ Unplanned safety system actuation.

One is a qualitative indicator, without a set target:

System Health Indicator (no target).

One indicator has been deleted:

Maintenance Services Rework Event Trend Records (ETR).

Two of the indicators are not applicable for this period:

- U-1 refueling outage duration.
- U-2 refueling outage duration.

Two confidential indicators reviewed with the DCISC during fact-findings include:

- Human factor security events.
- ↓ Vital area events.

Members and consultants had several questions during Mr. Rueger's review. Mr. Rueger and Mr. Oatley discussed the impact that a single event, such as the 12kV failure, can have on several of the indicators and they discussed the trends evident in several of the indicators.

Mr. Rueger discussed with the Committee the effect on DCPD operations of recent efforts to deregulate the electric power industry in California. He stated that a shortage of generating capacity within California has posed very significant challenges to assuring sufficient supplies of electricity are available to meet demand and that the impact of that shortage of supply is having significant impact upon the price of electric power. He observed that the Northern and Southern California electric power markets are separately administered by California's Independent System Operator (ISO). He also reviewed several of the fundamental factors which have contributed to significant increases in consumers electric bills in Southern California, as well as to a curtailment of supply, when the rate freeze ended in areas of Southern California. These factors included a significant increase in demand due to hot weather, growth of demand in out-of-state areas which previously exported power to California and significant increases in the price of natural gas and damage to a main natural gas supply pipeline to California. Mr. Rueger opined that these are very significant factors which have precluded, at present, a truly competitive market for electric power in California and that collusion amongst power generating entities has not played a significant role in increasing the price of power. Mr. Rueger stated that, as the rate freeze is still in effect for Northern California consumers, the full effects of the deregulated market have yet to be felt in Northern California and that issues of deregulation and its resulting impact on the price of power as well as a final decision as to what share of the increased costs are going to be paid by the consumer and by the utilities is going to be an important political issue for some time to come. He stated that any immediate impact on DCPD will depend on several price-related factors which may affect the time that DCPD-produced power is actually able to command market-rate prices. Members and consultants discussed with Mr. Rueger the factors and events which are driving the market for electric power and some of the future projections which will affect that market in California and elsewhere.

## Activities of PG&E's Nuclear Safety Oversight and President's Nuclear Advisory Committees.

Mr. Womack reviewed the activities of the Nuclear Safety Oversight Committee (NSOC) since the last public meeting of the DCISC.

A regular meeting of NSOC was convened at DCPD on July 25-26, 2000. Mr. Womack identified some of the items of particular interest to the DCISC which were discussed during that meeting. These included an update on the status of cultural transformation efforts, a summary of the 12kV bus event, the status of the Corrective Action Process and Enhancements, and the status of the issues before the State Regional Water Quality Board. Mr. Womack reported that NSOC has two new members, both of whom are external to PG&E. These new members are the Site Vice President at Comanche Peak and the Chief Operating Officer of the Wolf Creek nuclear generating facilities. He reported that by the beginning of 2001 NSOC will consist of a total of three external members and five members from within PG&E. Mr. Clark remarked that, during past discussion with PG&E, the Committee raised the question of the value of having a member of NSOC who specialized in human performance issues and Mr. Womack responded that PG&E periodically reviews the performance of NSOC with similar committees at other plants to assess NSOC's future role.

Mr. Jim Tomkins, Manager for Nuclear Safety, Assessment and Licensing at DCPD was recognized to make the next presentation to the Committee.

### Review of Reportable Events and NRC Notices of Violation.

Mr. Tomkins stated that there have been three reportable events at DCPD during the period June 7, 2000 through September 13, 2000. He then reviewed each in detail.

The first event involved a 12kV fault and fire which resulted in a declaration of an Unusual Event and a trip of U-1 and a loss of off-site power. The 12kV fault caused a fire and significant damage to 4kV bus and loss of vital power to vital loads. This led to a reactor trip and U-1 shut down safely as designed. The declaration of an Unusual Event was made based upon a fire which lasted longer than fifteen minutes and the loss of both sources of off-site power during



this event. The root cause was determined to have been the thermal failure of a bolted connection, apparently due to degradation or inadequate preventative maintenance, which was exacerbated by a marginal design. Most of the actual physical evidence was destroyed by the fire. Actions taken to preclude a re-occurrence have included upgrading the damaged 12kV bus material from aluminum to copper and refurbishing the damaged 4kV bus. INPO performed an Assist Visit to develop perspective on this event. Long-term corrective actions will include inspection, re-torquing and installation of new boots for all of the bolted joints; upgrading buses with little design margin to copper; and institution of a preventative maintenance program for non-segregated buses. In response to a questions from Dr. Rossin, Mr. Tomkins replied that off-site power to the 12kV system was not completely lost, but the Plant did rely on the emergency diesel generators (EDGs) for the 4kV system for about a day until offsite power was fully restored. Mr. Tomkins further reported that the NRC conducted a Special Inspection from May 15 to June 29, 2000 and held a public meeting in the local area concerning this event on June 29, 2000.

The NRC concluded that Plant's response was good, overall, and the Unusual Event was properly classified. NRC analysis confirmed the root cause and the corrective actions were found to be appropriate. The NRC did issue one non-cited violation (NCV) which resulted from a missed opportunity to detect the degraded condition following a transformer explosion in 1995.

On May 15, 2000, a second reportable event occurred which involved TS 3.0.3 being inadvertently entered when operators restored power to all Reactor Coolant System (RCS) accumulator isolation valves while RCS pressure was at 1500 psig, which was 500 psig above the minimum TS limit. Those valves are required to be operable and open-in-place any time RCS pressure is above 1000 psig. The cause was personnel error and the shift foreman was coached regarding the TS requirements. Operating Procedure L-5 will be changed to contain the TS pressurizer pressure requirement and a lamicoid notice now located at the equipment site will be revised to reference the TS number. Mr. Tomkins and Mr. Oatley discussed with Mr. Clark the nature of the individual counseling provided to the shift foreman and the need to address more than just the specifics of any single personnel error in attempting to prevent a reoccurrence.

Mr. Tomkins reported that on May 25, 2000, a third

reportable event occurred when U-1 was in Mode 3 and TS 3.4.9.1 was not met when operators failed to adequately document compliance with requirements for system heat-up limits. The cause was a faulty procedure which, while it required the Plant process computer to automatically record RCS parameter data, did not require the operators to periodically review that data. Allowable limits were never exceeded during this event. Procedures have been revised to assure adequate documentation of compliance and monitoring of RCS heatup and cooldown surveillance requirements.

Mr. Tomkins reviewed and discussed with the DCISC Notices of Violation (NOVs) from June 7 to September 13, 2000. He reported that there have been no cited NOVs received during this period. Three NCVs were issued for events which included: a portable load center not being restrained to prevent potential seismic interaction with adjacent component cooling water (CCW) piping, the use of an employee from the Emergency Planning organizations to assist in conducting an audit of that program and for re-energizing the safety injection accumulator discharge isolation valves above 1000 psig RCS pressure, which was discussed with the Committee during the review of the reportable events.

Mr. Tomkins observed that there have been significant reductions in the numbers of received NOVs to date in 2000 as compared to 1999. Common cause trend analysis performed by NQS has not identified any discernable trend in the cause of NOVs, however three NCVs have been received involving inadequate control of TS equipment. All NCVs received have been entered into the DCCP Trend Program. During 2000 there have been 13 NCVs received, as compared to a total of 34 during 1999.

In concluding this presentation, Mr. Tomkins briefly reviewed the NRC Performance Indicators and stated that the current white status window status for the Initiating Events Indicator is expected to return to green status very shortly. Mr. Oatley, Mr. Rueger and Mr. Tomkins discussed with the DCISC Members the development of the NRC Performance Indicator Program, its present areas of emphasis and the rationale for the development of certain indicators, currently being reviewed with the industry by the NRC.

## **XIX PUBLIC COMMENTS AND COMMUNICATIONS**

The Chair invited any members of the public present

in the audience who wished to address any remarks or comments to the DCISC to do so at this time. There was no response to this invitation.

**XX ADJOURN EVENING SESSION**

The evening meeting of the Diablo Canyon Independent Safety Committee was adjourned by the Chair at 6:40 P.M.

**XXI RECONVENE FOR MORNING SESSION**

The Friday, September 15, 2000 morning meeting of the Diablo Canyon Independent Safety Committee was called to order by the Chair at 8:05 A.M.

**XXII INTRODUCTORY COMMENTS BY COMMITTEE MEMBERS**

The Chair introduced the Members and the Committee's consultants and Legal Counsel present for this session of the public meeting. PG&E Senior Vice President Rueger was then asked to continue with the technical presentations requested by the Committee.

Mr. Rueger introduced the Director of Learning Services, Mr. Tim Blake, to make a presentation to the DCISC.

**XXIII INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)**

**Overview of the Training Program.**

Mr. Blake began the presentation with an overview of the twelve INPO-accredited training programs which are currently under the purview of the Learning Services organization. Six of these accredited training programs focus solely on the Operations organization:

- Non-licensed Operator.
- Reactor Operator.
- Senior Reactor Operator.
- Shift Manager.
- Shift Technical Advisor.
- Operations Continuing Training.

Members discussed with Mr. Blake and with Mr. Rueger the grouping of shift technical advisors, a position requiring an engineering degree, with the Operations training organization

rather than as a part of the Technical training organization. Mr. Rueger observed that treating the shift technical advisors as a part of the Operations organization appears to conform to current industry norms and is consistent with the function of the position as it has evolved at DCPD.

Two of the INPO-accredited programs serve both the Chemistry and Radiation Protection organizations, as their personnel are multi-functional:

- Chemistry Technician.
- Radiation Protection Technician.

Technical maintenance INPO-accredited training programs include:

- I&C Technician and Supervisor.
- Electrical Maintenance Personnel & Supervisor.

INPO-accredited programs are also focused on:

- Mechanical Maintenance.
- Maintenance Supervisor.\*
- Engineering Support.

(\*The maintenance supervisor programs have been separated into separate electrical and mechanical components.)

Mr. Blake then briefly reviewed and discussed the various other training programs at DCPD which are not INPO-accredited, these include:

- General Employee Training.
- Fire Brigade Training.
- Hazardous Material Emergency Response Training.
- Instructor Training.
- Respirator Training.
- Chemistry Technician Proficiency Training.
- Chemistry and Radiation Protection Non-Accredited Training.
- Radioactive Material Shipping & Radwaste Training.
- Qualification and Certification of Plant Staff.

In response to a query from Mr. Clark, Mr. Blake replied that each of these individual programs has a significant

element of supervisory skill training included as an integral part of the program.

Mr. Blake stated that the training programs are monitored in several ways. Performance Plan Reviews are prepared on a monthly basis for all accredited programs and are recognized as an important tool and used in conjunction with departmental goals by the Learning Services organization. Accredited programs also undergo annual self-assessments. An INPO Evaluation and Accrediting Board review takes place every four years for each of the INPO-accredited programs. NQS performs a continuous audit function for each of the training programs and NQS also reviews the qualification and training credentials of all personnel.

PG&E representatives discussed some of the instances where employees were discovered not to be properly qualified to perform assigned tasks, and Mr. Rueger reviewed some of the controls and the databases which are utilized at DCPD to remind employees of the necessity for timely re-qualification or other training requirements. Mr. Blake stated that the Performance Plan Review process tracks numerous items through the use of feedback, industry and Plant operating experience, assessments of the status of corrective actions and through PG&E's participation in outside assessment activities at other plants. He identified several of the warning flags which have been developed by INPO for the training organization and include: a lack of ownership by line and training managers; weak self-assessments; dissatisfaction as expressed by participants in the programs; failure to use the training experience to improve performance; lack of expertise; or distraction of management's attention from training program and its goals.

Mr. Blake reviewed with the Committee the Learning Services Training Program Evaluations Sheet and the Performance Plan Review for July 2000, which he described as a tool monitored by management on a monthly basis to review ten separate and distinct areas. This report is used to track performance concerning each INPO accredited training program. Members had several questions concerning the process of assembling the data for the Performance Plan Review and the nature and value of the feedback received from the participants in the training efforts, to which Mr. Blake and Mr. Womack and Mr. Oatley responded. **Mr. Clark stated that the Committee would like to review the tracking data concerning the INPO-accredited training and instructor**

training programs at DCPD on a quarterly basis and he suggested PG&E may want to review something similar to the Performance Plan Review format of the INPO-accredited training programs to monitor the non-accredited training programs. In response to a question from Dr. de Planque, Mr. Blake discussed the column on the Performance Plan Review entitled Human Performance in Lessons which reflects the efforts of the training organization to focus line-management on a forward-looking, proactive perspective on training issues to prevent error rather than focusing on training conducted in response to a particular incident or event.

Mr. Blake reviewed and discussed the Learning Services departmental goals which are updated on a monthly basis and which include assessment of: student satisfaction with training; support of the line organizations; self-assessment results; workload management; budget performance; NRC exam performance; human performance initiatives and training observations by management. He remarked that each INPO accredited training program has its own steering committee consisting of members from line management, incumbent program participants and Learning Services personnel. These steering committees review program feedback, select training settings and topics and review human performance issues. In response to questions from the Committee Members, the PG&E representatives reviewed current changes and evolutions within the various training programs at DCPD and remarked that the process-based budget management efforts will provide new data on the actual time expended by the DCPD organization in the entire training process and they reviewed some of the components of training organizations at some of PG&E's other non-nuclear facilities.

In response to a question from Mr. Clark, Mr. Oatley replied that around 16 or 17 employees have been added to DCPD's workforce by virtue of their union seniority rights as a result of PG&E divesting itself of most of its other generation assets, as required under the provisions of California's deregulation legislation. In response to a question from Consultant Wardell, Mr. Blake replied that the multi-discipline Asset Team leaders have completed the first phase of their required technical training and are expected to complete the balance of their training by the end of 2001.

Mr. Rueger then introduced the Director of Nuclear Quality Services at DCPD, Mr. Dave Taggart, to make the next presentation to the Committee.

**Results of the 1999 Biennial Nuclear Quality Services Audit and Self-Assessment.**

Mr. Taggart stated that Nuclear Quality Services (NQS) performs a self-assessment of its key activities every two years. During the years when self-assessments are not performed, NQS coordinates an audit of key NQS activities performed by independent industry peers, which in the past was referred to as the Joint Utility Management Audit (JUMA). The 1999 Biennial Audit was performed during the period December 6-10, 1999. He then discussed and reviewed the scope of that audit which included:

- Internal Audits.
- Supplier Audits.
- Receipt Inspection Program.
- Procurement Quality Testing Lab.
- Auditor Personnel Qualifications.
- Inspector Personnel Qualifications.
- Follow-up on Previous JUMA Findings.

In response to a query from Consultant Booker, Mr. Taggart replied that the scope of a Biennial Audit is determined by procedures which require the audit to address certain mandatory topics and by a review of previous problems or changes which have occurred within the DCPD organization. Mr. Taggart and Mr. Rueger stated that the audit findings are primarily directed to PNAC for its review, comment and direction and that a required minimum scope of the Quality Assurance (QA) audit function is an integral part of the FSAR. NSOC's external members have occasionally been asked to review the DCPD Quality Program and the performance of audits and to make recommendations to NSOC as a whole. Mr. Taggart remarked that the latest audit represented about 250 person-hours of assessment time and included industry peers from Palo Verde, WNP-2 (Columbia), Cooper and Fermi nuclear power plants. In response to a question from Dr. Rossin, Mr. Oatley responded that PG&E encourages and makes available DCPD personnel for similar efforts at other nuclear facilities in its attempt to identify the best practices industry-wide.

Mr. Taggart then reviewed with the Committee a summary of the independent peer group's conclusions and the results of the Biennial Audit as follows:

- The Internal Audit Program, the Supplier Audit Program and the Receipt Inspection Program exhibited good and very effective performance.
- The Material Testing Program exhibited satisfactory and effective performance.
- Improvements were necessary in the areas assessed from the last JUMA and the 1998 NQS Self-Assessment.
- Good teamwork was observed, both internally and externally within NQS.

There were three findings made by the 1999 audit team which included:

- Receipt Inspection Certification Packages were found with administrative errors.
- Two auditor certifications were found to be past due for their annual evaluation.
- A potential conflict was identified between Procurement Engineering and NQS procedures on sampling.

Mr. Taggart reported that the 1999 audit identified six strengths including:

- Senior NPG management participation and support of the internal audit process as demonstrated by the Senior Vice President's participation on the 1998 audit of Emergency Preparedness.
- Audits and assessments of the Engineering organization were found to be thorough, in-depth, performance-based and technically probing.
- Third party reviews and follow-up by NQS procurement assessment for potential impact on DCP.
- Development and use of the Plant Information Management System (PIMS) qualified suppliers list database, as well as other databases that support the receipt inspector.
- Development and implementation of the receipt inspector



qualifications guidelines.

- Receipt inspector qualifications and proactive support of the plant.

Mr. Taggart and Dr. Rossin briefly discussed the current requirements concerning the purchase and use of commercial grade materials by nuclear facilities. In response to a question from Consultant Wardell, Mr. Taggart confirmed that the next Biennial Audit is scheduled for 2001.

Mr. Womack reported to the DCISC that the NQS and Nuclear Safety Licensing and Assessment organizations at DCPD will be consolidated shortly in order to improve efficiency and he briefly reviewed the proposed structure of the new organization.

A short break followed.

Mr. Rueger requested Mr. Oatley to make the next technical presentation to the Committee.

#### Integrated Assessment Process Overview.

Mr. Oatley observed that the purpose of the Integrated Assessment Process is to use information obtained from various performance assessments to facilitate the early identification of declining or marginal performance. The Integrated Assessment Process facilitates communication to senior management and Plant staff of those recommendations which are made to enhance performance and it provides a means to evaluate DCPD performance against NRC criteria. He remarked that the Integrated Assessment Process does tend to focus on areas needing improvement, rather than those demonstrating identified strengths. The Integrated Assessment Process utilizes data from:

- NQS Quality Performance Assessment Report (QPAR).
- Line Self-Assessments.
- NRC Performance Indicators.
- NRC Inspection findings.
- Assessments of NRC violations.
- Significance Determination Evaluations.

Mr. Oatley reviewed the results of the Integrated Assessment Process for the second quarter of 2000 which he

stated has been compiled into a report directed to Mr. Rueger, as PG&E's Chief Nuclear Officer, from information provided by the Plant Manager and senior managers at DCPD. The second quarter report for 2000, while finding that overall performance was acceptable, identified the following issues:

- DCPD human performance is not improving and may be declining slightly in the Maintenance and Operations organizations.
- DCPD currently has an NRC Performance Indicator white status window for unplanned loss of normal heat sink for U-2.
- DCPD does not adequately trend low level errors due to inadequate guidance on when to write an Event Trend Record (ETR) and because of the complexity of the present software in use.
- DCPD has not made sufficient progress toward lowering personnel radiation exposure during non-outage periods.

Mr. Clark remarked that the Integrated Assessment Report appears to be a positive tool and he requested copies of the 2000 first and second quarter reports and a copy of the third quarter report when it is prepared for the Committee's review.

Mr. Oatley reviewed trends at DCPD since 1997 concerning the rate of human error which indicate that human error is increasing slightly at DCPD, although the Plant remains in the top quartile of the industry for acceptable human error performance. He observed that the increase in this trend somewhat correlates to those times within the Maintenance organization when there has existed the most concern regarding job security among the present workforce, as PG&E employees from other non-nuclear facilities were afforded and exercised their union rights to claim jobs at DCPD, as well as to those times when refueling outages were conducted which utilized additional contractor personnel on-site. Mr. Oatley reviewed efforts being made to identify the reasons for human errors and to create strategies to address them. Members discussed with Mr. Oatley and Mr. Rueger the value of using incentives and competition in lowering rates of human error, as well as use of self-verification efforts employing formal three-part communication and tail-board reviews and training sessions.

Mr. Clark remarked that the Committee is planning a fact-

finding during December 2000 to study how the various efforts to minimize human error at DCPD are integrated.

Mr. Rueger introduced Mr. Bruce Terrell, Supervisor of the Corrective Action Program at DCPD to make the next technical presentation to the Committee.

**Review of Tracking and Trending Results for Non-Cited Violations.**

Mr. Terrell began his presentation by reviewing the NCV criteria which he described as those violations with a very low safety significance and he discussed with the Members the definition of low safety significance as currently employed by the NRC. Mr. Rueger remarked that since the NRC has revised their process all nuclear plants have seen a drop in NOV's and the tracking and trending program for the NCVs at DCPD is an effort to make sure that these NCVs are given strict attention.

Mr. Terrell reviewed the circumstances which could result in a NCV rising to the level of a cited NOV. These include a failure to restore compliance within a reasonable time, failure to place the violation in the Corrective Action Program to address its reoccurrence, a repetitive violation which is the result of inadequate corrective actions or a finding that a violation is willful.

Mr. Terrell discussed the mechanics of managing the review process for tracking the NCVs. Status of corrective actions for NCVs are reviewed weekly and are analyzed by an engineer and the Error Review Team to ensure that the level of remediation is appropriate and adequate to the nature of the identified error. A tracking Action Request (AR) is initiated and all trend data for each NCV is entered on the Event Trend Record. Periodic trending of the NCVs is performed to determine the effectiveness of corrective actions. During the past one-year period, DCPD has received 27 NCVs, of which 8 are still open with corrective actions yet to be completed. One specific event has had a repeat occurrence. This involved the presence of a flammable, compressed gas container in the power block and DCPD management is evaluating the need for additional corrective actions. Mr. Terrell stated that the NCV trending data is the starting point for a process which ultimately includes evaluation of the entire scope of Plant ETR data. No discernable negative trends have been discovered to date within the ETR data categories, which include:

- Procedures being used.
- Work process data concerning procedural problems.
- Worker-related data concerning human error and procedural adherence.
- Organizational data from Operations, Maintenance, Engineering, etc.

Mr. Terrell briefly reviewed the individual attributes of the 27 NCVs received during the preceding one-year period as follows: 23 of the 27 involved surveillance test procedures; 22 of the 27 involved TS; 21 of the 27 involved administrative procedures. He then summarized the NCV trends according to the origin of the problems and he observed that problems in using and adhering to the TS were the most frequent contributor to NCVs at DCP. Members and consultants had several questions for Mr. Terrell concerning the data he presented. Mr. Terrell then reviewed Plant trend data which, he remarked, identified inattention and failure to adhere to procedure as significant items in the ETR database.

Mr. Terrell concluded his presentation with a review of the NCV ETRs by organization and noted that more than one department can be involved with generating a single NCV. Maintenance and Operations departments were identified as contributing to the largest share of NCVs which was not unexpected due to their direct impact on the Plant's operation.

In concluding his presentation, Mr. Terrell stated that DCP does have a program in place to review and trend all the NCVs received from the NRC as well as to analyze the various attributes of individual NCVs.

Mr. Rueger introduced Mr. Russell Gray to make the final technical presentation to the Committee.

#### Management of Radiation Exposure During 1R10.

Mr. Gray began the presentation with a brief history of the high radiation dosage rate experienced during the 1R9 refueling outage, which resulted in a 309.5 person-rem exposure and exceeded by a considerable margin the exposure goal set for 1R9 of 184 person-rem. Mr. Gray stated that the reasons for the higher exposure rate experienced during 1R9 were:

- RHR pipe dose rate was 2 to 4 times higher than that experienced during 1R8.
- The reactor head dose rate was about 2 times higher than that experienced during 1R8.
- The excess letdown system showed a significantly higher dose rate.

Mr. Gray observed, however, that the steam generator bowl dose rate during 1R9 decreased by an average of 12% due to the use of zinc injection during the 1R8-1R9 operating cycle. The zinc was injected in an effort to mitigate potential primary water stress corrosion cracking. He also identified as contributing to the high dose rate during 1R9 the forced outage experienced during December 1999; an increase in particulate activity transport during the end of the 1R8-1R9 cycle; and higher concentration of cobalt due to the injections of zinc and plate-out activity when RHR was placed in service.

Mr. Gray then reviewed the initiatives undertaken at DCPD during 2R9 to avoid the experiences of 1R9 and their anticipated effect. The RCS pH was lowered near the end of the fuel cycle in an attempt to avoid an end-of-cycle increase in RCS activity. The Chemical Volume and Control System (CVCS) filters were changed out during the end of cycle to reduce dissolution of source term at the end of the cycle. The zinc injection concentration was lowered to reduce the potential effect of the zinc. There was a complete boration of the RCS prior to cooldown to ensure acid reducing conditions prior to cooldown. A hold was reestablished at 325°F prior to RHR initiation, to support the dissolution of particulates. The RCS temperature at which the RHR is placed in service was lowered to reduce thermal delta which may drive particulate drop out. The RHR was pre-heated before being placed into service to reduce thermal delta which may drive particulate drop out. Forced oxygenation of the RCS was scheduled for a specific time, in order that a minimum of work could be scheduled for the high dose rate period during forced oxygenation.

Mr. Gray reviewed efforts made within the DCPD organization to achieve lower dose rates during 2R9. These included emphasis on principles of accountability, the As Low As Reasonably Achievable (ALARA) Program, coordination between workgroups, better staffing, outage planning and work

practices and increased training for radiation and technical workers. A Rad Worker Handbook was developed and extensive tailboards were conducted with workgroups. Databases were established to trend workers' practices and ALARA Program staffing was redesigned. Service level agreements were made with the Asset Teams and there was increased management involvement with radiation protection issues. The results for 2R9 were the lowest dose rates ever experienced at DCPD for an outage, 120.3 person-rem, and improved rad worker performance in terms of low numbers of documented errors.

Mr. Gray discussed the May 2000 forced outage for U-1 caused by a bus fire which tripped the plant. Little radiological work was performed but a 2.5 person-rem dosage was accumulated during this forced outage. Lessons concerning chemistry were incorporated into the forced outage and forced oxygenation was performed and resulted in a good cleanup. However, Mr. Gray remarked that U-1 developed unexpectedly high dose rates in the RHR and Letdown Systems during start up for reasons which are still not fully understood.

Mr. Gray stated that DCPD, as compared to other nuclear facilities, showed a higher dose rate for personnel, on the order of 2 to 3 person-rem per month, and he observed that management recognized that this was too high for a pressurized water reactor. An effort was initiated, entitled Manage the Mili-Rem, to focus attention on small doses. He discussed and described some other efforts being undertaken DCPD to reduce dose, including increased use of temporary shielding during non-outage periods; reduction in the number of radiation protection surveys and containment entries; purchase of new telemetry and electronic dosimetry systems; improvement to equipment and techniques to reduce exposure to rad waste personnel; and the use of ultrasound for venting the Emergency Core Cooling System (ECCS).

The goal for 1R10 was set as an exposure goal of 147.5 person-rem, to be achieved using shutdown techniques similar to those used during 2R9 with the addition of an RHR flush during startup. Other planned flushes will include containment spray/RHR on the 115 foot level of containment and the RHR above the RHR sump. Work activities have been planned factoring daily exposure goals and any deviation from these goals will receive management attention.

Plans for monitoring radiation exposure during 1R10 include early characterization of radiological conditions and

a communication plan. Mr. Gray stated that the overall outage exposure goal for 1R10 is somewhat high due to the dosage received during the May forced outage. Mr. Gray discussed with the Members the various factors impacting the exposure rates, given the outage duration, and he then compared exposure rates experienced at other facilities and discussed the possibility of altering the exposure goal as an outage progresses. The PG&E representatives discussed their method of setting goals with Dr. Rossin and stated that these goals are not normally varied during an outage. The 1R9 outage was an exception to this rule due to the greater source term experienced and its impact on the outage incentive package. In response to a question from Dr. Rossin, Mr. Gray replied that the administrative limit of 2 rem for any employee is never exceeded and the highest dosage for any employee has been an exposure of 1.7 to 1.8 rem. Mr. Clark questioned, and Mr. Gray and Mr. Rueger confirmed, that a source-term reduction program is currently an element of the ALARA program. Mr. Gray observed that there are significant differences in dose rate between U-1 and U-2 and Mr. Clark mentioned that the North Anna Plant has similar differences between its operating units. Mr. Gray confirmed that PG&E is working with the Electric Power Research Institute (EPRI) and INPO to identify the reasons for the differences between the DCPD units.

#### **XXIX PUBLIC COMMENTS AND COMMUNICATIONS**

The Chair invited public comments at this time, however, there were no comments by members of the public. The Committee then returned to a discussion on the approval of fact-finding reports.

#### **XXV CONCLUDING REMARKS AND DISCUSSION**

Drs. de Planque and Rossin observed that the technical presentations made by PG&E were valuable and informative. Mr. Clark reviewed and discussed with the PG&E representatives the two days of fact-finding scheduled for December 2000, with Dr. Cass, to review human performance issues as well as other technical issues at the Plant site. Dr. Rossin reported that he is planning a fact-finding with Consultant Wardell during October 2000 and is also planning to attend the meetings of PNAC and NSOC with Consultant Booker in November 2000. Dr. Rossin also remarked that he is planning a meeting with Mr. Rueger in San Francisco at Mr. Rueger's convenience. Dr. de Planque stated that she planned to

schedule a fact-finding during Spring of 2001 to attend an emergency drill and she requested that PG&E provide a schedule for the PNAC and NSOC meetings scheduled for 2001 when it is available.

The next public meeting of the DCISC are scheduled for February 7-8, June 20-21 and October 17-18, 2001.

**XXVI      ADJOURNMENT OF THIRTY-FIRST SET OF MEETINGS**

There being no further business, upon a motion by Dr. Rossin, seconded by Dr. de Planque, the thirty-first meeting of the Diablo Canyon Independent Safety Committee was adjourned by the Chair at 12:10 P.M.



**NOTICE OF MEETING, PUBLIC FACT-FINDING  
AND PLANT TOUR BY  
THE DIABLO CANYON INDEPENDENT SAFETY COMMITTEE**

NOTICE IS HEREBY GIVEN that on February 7, 2001, at 8:00 A.M., the members of the Diablo Canyon Independent Safety Committee ("DCISC") will conduct an inspection tour of the Diablo Canyon Power Plant. This tour, which will take approximately four hours, will be open to the public on a limited basis, as follows: because the plant is an operating nuclear power plant, the tour will be limited to fifteen (15) members of the public on a reserved first-come, first-served basis, with preference given to those members of the public who have not attended previous DCISC tours, and with prior clearance of all public attendees required in compliance with NRC procedures.

NOTICE IS HEREBY FURTHER GIVEN that on February 7 and 8, 2001, at the Cliffs at Shell Beach Conference Center, 2757 Shell Beach Road, Shell Beach, California, a public meeting and fact-finding will be held by the DCISC in four separate sessions, at the times indicated, to consider the following matters:

1. **Afternoon Session - (2/7/2001) - 1:30 P.M.:**  
Introductory comments, approve minutes of September 14-15, 2000 meetings; consider PG&E's response to the 1999-2000 DCISC Annual Report; a review of the DCISC Open Items List; discussion of administrative matters; Committee member and staff-consultant reports including a report on the plant tour; receive, approve and authorize transmittal of fact-finding reports to PG&E; and to receive public comments and communications to the Committee.

2. **Evening Session - (2/7/2001) - 5:30 P.M.:** Comments by Committee members; consider various technical presentations requested by the Committee from PG&E on topics relating to plant safety and operations, including an update on plant events and operational status, a review of DCISC and NRC selected performance indicators, an update on the activities of PG&E's Nuclear Safety Oversight Committee, a review of NRC Notices of Violations and Licensee Event Reports, a presentation on Nuclear Quality Services 2000 Review; and receive public comments and communications to the Committee.

3. **Morning Session - (2/8/2001) - 8:00 A.M.:** Opening comments by Committee members; consider further technical

presentations from PG&E on topics relating to plant safety and operations, including the 2001 Culture Transition Strategies, a review of refueling outage 1R10 steam generator tube test results, a review of refueling outage 1R10 As Low As Reasonably Achievable (ALARA) and dose results, a presentation on the status of the California energy issue, a discussion of the California energy issue and Diablo Canyon Power Plant's actions; receive public comments and communications to the Committee; and wrap-up discussion by Committee members and the scheduling of future site visits, study sessions and meetings.

4. **Afternoon Public Fact-Finding - (2/8/2001) - 1:30 P.M.:** Convene public fact-finding and consider technical presentations by PG&E on topics relating to plant safety and operations including the overall result of refueling outage 1R10, a presentation on refueling outage 1R10 and the Safety Plan, a discussion of PG&E's Nuclear Power Generation Five-Year Business Plan; receive public comments and communications to the Committee; and adjournment of the public fact-finding.

The specific meeting and fact-finding agenda and the staff reports and materials regarding the above agenda items will be available for public review commencing Monday, February 5, 2001, at the NRC Public Document Room of the Cal Poly Library in San Luis Obispo. **For further information regarding the public meeting and fact-finding, please contact Robert Wellington, Committee Legal Counsel, 857 Cass Street, Suite D, Monterey, California, 93940; telephone: 1-800-439-4688 or visit the Committee's website at [www.dcisc.org](http://www.dcisc.org). To make a reservation for the plant tour, please telephone the Committee's office on a weekday between the hours of 9:00 A.M. and 5:00 P.M. at 1-800-439-4688. Please make your call prior to 5:00 P.M. on Thursday, January 25, 2001, when tour reservations will be closed.**

Dated: January 18, 2001.

**DIABLO CANYON**  
**INDEPENDENT SAFETY COMMITTEE**

Committee Members: Philip R. Clark  
E. Gail de Planque  
A. David Rossin

\* \* \* \* \*

**AGENDA**

Wednesday & Thursday  
February 7 & 8, 2001  
Shell Beach, California

Cliffs at Shell Beach  
Hotel Conference Center  
2757 Shell Beach Road

**Afternoon Session - 2/7/2001 - 1:30 P.M.**

- I. CALL TO ORDER - ROLL CALL
- II. INTRODUCTIONS
- III. CONSENT AGENDA (Routine items which the Committee can approve with a single motion and vote. A member may request that any item be placed on the regular agenda for separate consideration.)
  - A. Minutes of September 14-15, 2000 Meetings: Approve
- IV. ACTION ITEMS
  - A. PG&E Response to the 1999/2000 DCISC Annual Report Discussion
  - B. Review of the Open Items List Discussion/Action
  - C. Update on Financial and Budgetary Matters for 2000/2001 Discussion/Action
  - D. DCISC Activities During 2001 Discussion
- V. COMMITTEE MEMBER REPORTS AND DISCUSSION
  - A. Site visits and Other Committee Activities
  - B. Documents Provided to the Committee
- VI. STAFF-CONSULTANT REPORTS
  - A. Ferman Wardell  
Fact-finding topics
  - B. Jim E. Booker  
Fact-finding reports
  - C. Dr. Hyla Cass

Human performance Issues  
D. Robert Wellington  
Administrative and legal matters

VII. COMMITTEE FACT-FINDING REPORTS:  
Receive, approve and authorize transmittal to PG&E

VIII. CORRESPONDENCE

IX. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No immediate action will be taken on matters raised, but they may be referred for further study, response or action.)

X. ADJOURN AFTERNOON MEETING

Evening Session - 2/7/2001 - 5:30 P.M.

XI. RECONVENE FOR EVENING MEETING

XII. INTRODUCTORY COMMENTS

XIII. INFORMATION ITEMS BEFORE THE COMMITTEE

A. Technical Presentations Requested by the  
Committee of P.G. & E. Representatives:

- 1) General Introductions
- 2) Plant Events and Operational Status
- 3) Review of DCISC-Selected  
Performance Indicators
- 4) Review of NRC-Selected  
Performance Indicators
- 5) Activities of PG&E's Nuclear  
Safety Oversight Committee
- 6) Review of NRC Notices of Violations  
and Licensee Event Reports
- 7) Nuclear Quality Services 2000 Review

XIV. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)

XV. ADJOURN EVENING MEETING

Morning Session - 2/8/2001 - 8:00 A.M.

XVI. RECONVENE FOR MORNING MEETING

- XVII. INTRODUCTORY COMMENTS
- XVIII. INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)
- 8) 2001 Culture Transition Strategies
  - 9) Refueling Outage 1R10 Steam Generator Tube Test Results
  - 10) Refueling Outage 1R10 "As Low As Reasonably Achievable" (ALARA) and Dose Results
  - 11) Status of California Energy Issue
  - 12) California Energy Issue - Diablo Canyon Power Plant's Actions
- XIX. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)
- XX. ADJOURN MORNING MEETING

Afternoon Session - 2/8/2001 - 1:30 P.M.

- XXI. RECONVENE FOR AFTERNOON MEETING
- XXII. MEMBERS COMMENTS
- XXIII. INFORMATION ITEMS BEFORE THE COMMITTEE (Con'd.)
- 13) Refueling Outage 1R10 Overall Results
  - 14) Refueling Outage 2R10 and Safety Plan
  - 15) Five-Year Nuclear Power Generation Business Plan
- XXIV. PUBLIC COMMENTS AND COMMUNICATIONS (Oral communications on Committee matters, limited to 5 minutes per speaker. No action will be taken on matters raised, but they may be referred for further study, response or action.)
- XXV. CONCLUDING REMARKS AND DISCUSSION BY COMMITTEE MEMBERS
- A. Future Actions by the Committee
  - B. Further Information to Obtain/Review
  - C. Scheduling of Future Site Visits, Study Sessions and Meetings
- XXVI. ADJOURNMENT OF THIRTY-SECOND SET OF MEETINGS.

M I N U T E S  
of the  
FEBRUARY 2001 MEETING  
OF THE  
DIABLO CANYON INDEPENDENT SAFETY COMMITTEE

Wednesday & Thursday  
February 7-8, 2001  
Shell Beach, California

Notice of Meeting

A legal Notice of Meeting was published in local newspapers, along with several display advertisements, and was mailed to the media and those persons on the Committee's service list.

Agenda

**I      CALL TO ORDER**

The February 7, 2001, afternoon meeting of the Diablo Canyon Independent Safety Committee(DCISC)was called to order by Committee Chair Philip R. Clark at 1:30 P.M. at the Cliffs at Shell Beach Hotel Conference Center in Shell Beach, California.

Present:            Committee Chair Philip R. Clark  
                     Committee Member Dr. E. Gail de Planque  
                     Committee Member Dr. A. David Rossin  
Absent:             None

**II      INTRODUCTIONS**

Mr. Clark introduced the Committee Members, the consultants and Legal Counsel in attendance at these meetings.

**III     CONSENT AGENDA**

The Chair requested Legal Counsel Wellington to present the only item from the Consent Agenda, a routine item which the Committee could approve by vote or, on motion of a Member, remove to the regular agenda. That item was approval of the Minutes of the September 14-15, 2000 DCISC Meetings. Revisions to content were suggested and approved by the Members and editorial corrections were noted and provided to Mr. Wellington.

Committee Business

**IV ACTION ITEMS**

A. PG&E Response to the 1999/2000 DCISC Annual Report. Committee Members and consultants discussed, reviewed and evaluated responses by PG&E to the Committee's Recommendations contained in its 1999/2000 Annual Report on Safety of Diablo Canyon Operations and they discussed certain of the PG&E responses with PG&E Vice President Larry Womack:

- R2000-1 Re: PG&E emphasis on assuring employees, particularly within Operations, improve Technical Specification(TS)adherence - Response found acceptable, however, the DCISC will continue to follow-up on PG&E's performance concerning adherence to TS in the future.
- R2000-2 Re: including all Licensee Event Reports(LERs), which involve problems affecting offsite power, in the Corrective Action Program effectiveness review and to report the results to the DCISC during a future fact-finding or public meeting - Response found acceptable.
- R2000-3 Re: assuring that, during review of the Aging Management Program, adequate program controls and functions are maintained and any revised program is designed and resourced to be at least as strong and effective as the previous program - Response found acceptable, subject to PG&E providing a list of the systems which will and will not be covered by the long-term Aging Management planning process.
- R2000-4 Re: training of foremen for all the Asset Teams in areas where they lack expertise - Response found acceptable.
- R2000-5 Re: PG&E visiting other utilities with strong Corrective Action Programs to measure their effectiveness and help in the further development of the Diablo Canyon Power Plant(DCPP)Corrective Action Program - Response found acceptable, subject to DCISC review of

the Nuclear Energy Institute (NEI) Corrective Action Benchmarking Project report and PG&E's implementation of the lessons identified in that report.

- R2000-6 Re: performing a comprehensive review to assure all materials subject to aging or requiring periodic replacement are included in aging and replacement management programs and to address any other areas where a manufacturer's guidance may not have been followed - Response found acceptable.
- R2000-7 Re: investigating a method to coordinate various Human Performance Programs and to disseminate information within the DCP organization on these Programs - Response found acceptable.
- R2000-8 Re: augmentation of programs for operator health, fitness and aging to address relevant issues and to further improve operator human performance - Response found acceptable.
- R2000-9 Re: emphasizing teaching operators to recognize the priorities of the tasks themselves, rather than relying largely on prioritized procedures - Response found acceptable. The issue may be followed-up during a future fact-finding.
- R2000-10 Re: Nuclear Quality Services (NQS) involving the Nuclear Safety Oversight Committee (NSOC) in the selection and the scope of the Biennial Audit/Self-Assessments to be sure of the independence of the NQS department - Response found acceptable.
- R2000-11 Re: initiating a review by the Design Engineering organization, or at the Plant Staff Review Committee (PSRC) or NSOC level, to determine if any other design basis requirements, particularly in the civil engineering area, have not been implemented such as with the Seismic Gap Program, the emergency diesel generator (EDG) seismic wall problem and the previously corrected seismic masonry wall inadequacies - Response found



acceptable.

R2000-12 Re: continuing short and long-term development of the System Summary Health Report for all systems and sharing this information with Operations, Maintenance and Engineering - Response found acceptable, subject to receipt of a comprehensive listing of DCPD systems for which System Summary Health Reports will be implemented.

R2000-13 Re: review of the Intake Structures concrete inspection plan for each refueling outage to assure that the entire inspection plan is implemented and conducted and that necessary repairs are made to these structures - Response found acceptable, however, DCISC will follow-up concerning the specific reasons for not inspecting these structures during certain past refueling outages.

The Chair reported that the Committee accepted all of the PG&E responses to the DCISC Recommendations contained in the 1999/2000 Annual Report.

B. Review of Open Items List. Consultant Ferman Wardell reviewed the Open Items List which is used to track items which the Committee designated for follow-up, requested further information during fact-finding, at its public meetings or in its Annual Report. In response to a query from the Chair, Mr. Wardell reported that the total number of items on the List appears to be decreasing slightly. The Chair reviewed with the other Members the efforts made to consolidate and review the frequency with which the Committee commits to revisit certain of the topics on the Open Items List. Mr. Clark requested the Members and consultants carefully review all the items which are recommended on the List for closure to verify the appropriateness of that action. Any requests to continue items indicated for closure on the current Open Items List should be provided to Mr. Wardell during this public meeting of the DCISC.

C. Update on Financial & Budgetary Matters for 2000-2001. The Chair requested Mr. Wellington to review financial reports received from the Committee's Accountant. Members discussed with Mr. Wellington the DCISC spending for 2000, and the amount to be remitted to

PG&E for grantor trust funds remaining and not disbursed by the Committee at the end of the 2000 calendar year. **The Members directed the Committee's accountant to discontinue the reference to profit on the Committee's financial statements, as the Committee receives its funding in trust from PG&E as the grantor, and the DCISC does not retain any profit from its operations. The Committee directed Mr. Wellington to instruct the Committee's Accountant to review the Committee's financial records and continue to comply with California's new child support enforcement regulations.**

D. DCISC Activities During 2001. Mr. Clark stated that he plans to attend a fact-finding meeting with Consultant Wardell at DCPD during March 14-15, 2001. Dr. Rossin and Consultant Jim Booker will coordinate their schedules with PG&E's calendar of events to arrange for a fact-finding for the third week of April 2001. Dr. de Planque reported that she is planning to attend fact-finding meetings and a meeting of NSOC at the Plant during May 1-2, 2001, and that she would be available to meet with State representatives, either before or after the next scheduled public meeting of the Committee on June 20-21, 2001. The Committee Members and consultants discussed coordinating a fact-finding on human performance issues with Consultant Dr. Hyla Cass and PG&E during June 2001. Dr. de Planque will investigate any possibility of altering her existing commitments to permit her attendance at the Emergency Drill scheduled for August 17, 2001. **The Chair requested that Members and consultants coordinate agendas for future fact-findings with Mr. Wardell and Mr. Booker to ensure continued coverage of those items selected for follow-up on the Open Items List. The next public meetings of the DCISC are scheduled for June 20-21 and October 17-18, 2001. The Chair requested that the Members continue the practice of making an annual visit to their appointing State agencies to update them and discuss the Committee's current activities.**

A short break followed.

## V COMMITTEE MEMBER REPORTS AND DISCUSSION

a) Site Visits and Other Committee Activities: Dr. Rossin reported that he participated in two fact-findings with PG&E, the first with Consultant Wardell was held on October 25-26, 2000, and took place during a refueling outage. The DCISC representatives observed a shift turnover and activities within Containment. They also held discussions with PG&E concerning issues of low-level radioactive waste and the

integrity of the reactor pressure vessel and met with the Director of Human Resources at DCPD.

A second fact-finding with Consultant Booker included attending a meeting of NSOC and discussions with PG&E concerning pipe cracking, fuel, and spent fuel storage issues. Dr. Rossin reported that these fact-findings proved to be useful and informative.

In response to a query from Mr. Clark, Mr. Womack replied that PG&E has made a decision to proceed with dry spent fuel storage and is presently working with HOLTECH, a contractor, on the design of a dry cask spent fuel storage facility for DCPD. In response to a question from Dr. Rossin, Vice President Womack opined that there would be concern and possible opposition from segments of the local community to PG&E's License Amendment Request (LAR) to the NRC to approve dry cask on-site storage of spent fuel.

Mr. Clark reported on a fact-finding held in December 2000, with Consultants Dr. Cass and Mr. Booker. The first day of the fact-finding concerned human performance, behavior, health and wellness issues and Mr. Clark reported that PG&E appears to be making significant efforts to address human error. The second day of the fact-finding concerned topics which will be reviewed during Mr. Booker's report.

Mr. Clark then reported briefly on his meeting with Commissioner Laurie of the California Energy Commission. The Commissioner and his staff received information on the Committee and its activities from Mr. Clark and he answered several questions concerning the Committee and its role.

b) Documents provided to the Committee: Mr. Wellington reviewed the lists of the documents provided to the Committee by PG&E, the NRC and other sources since the last public meetings of the Committee.

## **VI STAFF-CONSULTANT REPORTS**

Consultant Wardell reported on the October 25-26, 2000, fact-finding meeting with Dr. Rossin. This fact-finding was conducted during the tenth refueling outage for Unit 1 (1R10) and the DCISC representatives observed an Outage Daily Meeting, visited the Outage Work Control Center and discussed the Outage Safety Plan with the Outage Director. Mr. Wardell reported that there were three reportable events during 1R10 which PG&E will review with the DCISC. It was reported that

PG&E created a chart, used during 1R10, to determine the risk of loss of heat removal at any time during a refueling outage. This chart is used during Outage Daily Meetings and it shows the Reactor

Coolant System (RCS) water level versus heat removal for various modes of operation. Mr. Wardell and Dr. Rossin commented that the chart was a useful tool and Dr. Rossin suggested that PG&E consider sharing this valuable and effective tool within the nuclear industry.

The DCISC representatives then met with the Turbine Component Engineer to discuss work performed on the Unit 1 (U-1) Turbine, resulting from a blade which was lost due to hot cycle fatigue. They also toured Containment, observed fuel movement, Radiation Protection (RP) controls and a Control Room Shift Manager turnover and control board walkdown. During the fact-finding, Dr. Rossin had an opportunity to meet with several DCPD managers. Mr. Wardell and Dr. Rossin also met with the NRC Resident Inspector for DCPD and the Inspector confirmed the NRC's intent to continue to review issues at DCPD regarding human performance and the effects of deregulation on the transmission system and grid reliability. They also discussed with the inspector the NRC's implementation of its risk-based review process. The DCISC representatives also took a driving tour of DCPD to familiarize Dr. Rossin with the important physical features of the Plant site. **Mr. Clark commented that the Committee may wish to consider meeting on a regular basis with the NRC's Resident Inspector at DCPD during some of its fact-findings held at the Plant site.**

Dr. Rossin and Mr. Wardell met with the System Engineer for the Liquid and Solid Radioactive Waste Processing Systems and received a briefing on those Systems. They held discussions with the Component Engineer concerning the integrity of the Reactor Pressure Vessel. In response to a query by Mr. Clark, Dr. Rossin replied that it appears there is sufficient margin concerning Reactor Pressure Vessel embrittlement to permit continued operations during the full term of the current license period for DCPD. The DCISC representatives also met with the current Director of the Aging Management Program and observed that PG&E has not yet met some of its earlier established goals for the Aging Management Program. The Program Director discussed some areas which PG&E will be addressing to meet management's expectations for the Aging Management Program. A discussion

was also held with the RP Program Director during this fact-finding. A detailed report of the Fact-Finding will be developed and included in the Annual Report.

Mr. Wardell briefly discussed the Annual Report preparation schedule and distributed individual assignments for sections of the Committee's Eleventh Annual Report on the Safety of Diablo Canyon Nuclear Power Plant Operations, covering the period July 1, 2000 through June 30, 2001.

Committee Consultant Booker reported on the November 14-15, 2000, fact-finding conducted with Dr. Rossin. DCISC representatives attended a joint meeting of PG&E President's Nuclear Advisory Committee (PNAC) and the NSOC and they reported that the joint meeting format proved an excellent and efficient venue to permit the participants to remain informed on the major issues affecting DCPD and that the DCISC should consider recommending to PG&E that the joint format be continued whenever possible.

The DCISC representatives received a presentation on the Intake Structure inspection and repair and the RP Program results during 1R10 and they reviewed the corrective actions taken and those planned, which resulted from a U-1 reactor trip on September 22, 1999, caused by a lightning strike in a switchyard. They also reviewed the results of the steam generator (SG) inspections during 1R10 and discussed PG&E's plans for addressing the spent fuel storage issue and the efforts to disseminate information to the public concerning those plans. The DCISC representatives held discussions concerning DCPD nuclear fuel and issues relating to the use of boraflex in the Spent Fuel Pool. In response to a query from Dr. de Planque and an observation by Dr. Rossin, **it was noted that all reference to discussions and observations contained within Committee fact-finding reports should clearly indicate when a comment is taken from NSOC or PNAC materials or participants and when a comment expresses the opinion or observations of the DCISC representatives.** A detailed report of the Fact-Finding will be developed and included in the Annual Report.

Mr. Booker reported on a fact-finding held on December 14, 2000, with DCISC Member Clark. Topics reviewed with PG&E on that occasion included a report on the status of the Transition Program preparing DCPD for competition and he noted that activities outstanding from the Transition Plan are now being included in the long-term Performance Plans for DCPD.

The DCISC representatives discussed the Engineering Workload Performance Indicators used to assess resources available to accomplish work assigned. In response to a question from Dr. Rossin and Mr. Clark, Vice President Womack observed that PG&E is not surprised that some employees have raised issues concerning the number of *ad hoc* committees on which they serve, however, PG&E continues to believe the efficiency-improving objectives which are realized through the use of plant-wide, rather than intra departmental committee participation warrant the time spent in those efforts. Mr. Womack discussed PG&E's expectations concerning communication to their workforce from the directors, managers and supervisors participating in committees. Mr. Clark and Mr. Booker also had a presentation by PG&E on NRC approved alternate source terms which can be used by utilities for accident calculations and PG&E's plans to implement these alternate requirements. The DCISC representatives reviewed the status of the STARS Program, in which DCPD participates and which fosters cooperation by and between four other nuclear power plants with similar design. Mr. Booker reported that the NQS organization reviewed the efforts made in addressing computer problems experienced by DCPD's Security organization and that the DCISC representatives were provided an update on the Self-Assessment Program. **Mr. Clark commented that the Committee may wish to consider conducting a review of the DCPD Security organization and the level of attention given to that organization by PG&E management.**

Committee Consultant Dr. Hyla Cass M.D. reported to the Committee on the fact-finding of December 13-14, 2000, which she attended with Member Clark. Dr. Cass commented on multiple issues which were addressed by the Committee in their 1999/2000 DCISC Annual Report and which concern human performance.

Dr. Cass observed that the DCISC representatives discussed during the fact-finding the efforts at DCPD to create additional incentives for increased physical fitness and to implement successful stress management techniques.

The Human Performance Coordinator for DCPD presented an overview to the DCISC representatives which indicated that efforts to improve human performance have the full support of Plant Management and a steering committee of senior managers is working with various departments to review human performance issues and systems for error prevention on a plant-wide basis to ensure efforts to improve human

performance continue throughout the DCPD organization. These efforts include emphasizing the use of effective tailboard pre work briefings and the importance of three-way communication and self-verification.

Dr. Cass reported that the error rate at DCPD, as measured over periods of 90 days and using 10,000 person-hour work increments, has shown an upward trend over the past one-year period. Vice President Womack confirmed the error rate was trending higher and he stated that this justifies PG&E placing additional focus on human performance improvement and the reduction of the error rate.

Dr. Cass reviewed with the Committee some of the innovations PG&E has introduced, including determining which organizations are responsible and assessing organizational, as well as individual responsibility, for error and using the first page of the Outage Plan of the Day publication to emphasize safety and human performance.

Dr. Cass observed that 40% to 50% of errors involve the Maintenance organization and that DCPD Management has implemented a Management Observation Program (MOP) to focus on behavioral causes for errors rather than on the results. She stated that poor communication, a lack of attention to tailboards and the STARS self-verification system, and over reliance upon direction by others have contributed to the error rate within the Maintenance organization.

Dr. Cass observed that aging of the DCPD workforce is another factor impacting Plant-wide industrial safety.

Dr. Cass noted that PG&E reported it is placing increasing reliance on tailboards, three-way communication and self-verification techniques and Dr. Cass opined that PG&E recognizes that organizational culpability does not exonerate an individual from responsibility and a need for counseling or coaching.

Dr. Cass reported that it appears that the error rate is not significantly impacted by PG&E's use of contractor personnel during refueling outages. Dr. de Planque questioned whether PG&E is using definitions which are accepted industry-wide concerning identification and categorization of error. Vice President Womack remarked that there are currently no accepted standards for event tracking and the types of errors precipitating an event, however, he noted that the Corrective

Action Program does provide a framework through the use of the Action Request (AR) process and the initiation of an Event Trend Record (ETR).

Dr. Cass observed that there is a separate Engineering Human Performance Committee which reports on Engineering performance, including the evaluation of ETRs, and that efforts are being made within the industry to address human performance issues.

Dr. Cass reported that she and Mr. Clark met informally with DCPD supervisors representing various departments. During this meeting they discussed issues raised by the supervisor including: 1) the average time taken to address ARs, which is now around 130-days as compared to 600-days previously; 2) increased efforts to foster cooperation between the craft personnel in the Maintenance and Operations organizations which appeared to be beneficial to Plant performance during the last refueling outage; 3) the Maintenance craft organization expressed need for more supervisors in the field and increased inclusion of their organization in the use and evaluation of results and feedback from the data collected, surveys made or complaints registered; 4) the Operations organization expressed awareness of an increased scrutiny from supervisors and their feeling that human performance critiques should be framed more in terms of positive praise. Dr. Cass expressed her observation that the dialogue with the DCPD workforce appeared to be open and thoughtful.

The DCISC representatives also met with the Director of Operations to discuss incentives and efforts to increase physical fitness, attention enhancement and effective stress management. The Committee has addressed the need for these efforts in its last two Annual Reports and during numerous fact-findings with PG&E. She reported that there is currently a requirement that operators maintain a defined level of fitness or they are not permitted to be alone in the Control Room. However, as DCPD requires four licensed operators to be in the Control Room at any time, this requirement is not a significant motivating factor for Operations personnel. Health classes have been scheduled as a part of the operators' requalification training program and Dr. Cass observed they should prove valuable in disseminating information on the benefits of increased physical fitness. She remarked that the current Operations Director has been recognized as a leader and innovator in the use of physical fitness as a team-



building activity and Dr. Cass recommended that the Committee continue to encourage those efforts.

Dr. Cass reported that PG&E has adopted new policies which remove certain nonessential activities and functions from the environs of the Control Room, thereby creating a more formal atmosphere in the DCPD Control Room. She remarked that this effort appears to be part of a positive direction to enhance professionalism and decrease distraction in the Control Room.

The DCISC representatives met with a representative of the Employee Concerns Program (ECP) who reported that the number of formal concerns raised within that Program has decreased from previous years. Employees continue to utilize the ECP for informal contacts which are handled through discussion, intervention or mediation. However, the number of NRC allegations from all sources concerning DCPD is higher than in previous years. The DCISC representatives expressed their belief that PG&E should determine the reasons for the increase in the numbers of allegations which are approximately double the average of other plants in the region. **Mr. Clark briefly discussed the need by PG&E to appropriately address differences in their handling of concerns, as opposed to informal contacts, raised with the ECP. Dr. Cass observed that the next Synergy Inc. survey of the safety culture at DCPD is scheduled to be completed soon and she confirmed that the Committee requested an opportunity to review the results of that survey when they are available.**

Dr. Cass reported that a new Behavior-Based Safety Process has been instituted within the Maintenance organization at DCPD in response to the higher injury rate experienced. This process tracks incidents and identifies barriers to work safety in an effort to institute continuous improvement in work process and practices.

In concluding her presentation, Dr. Cass remarked on her visit to the DCPD Medical Center to observe a cardiac health class and her observation that the Medical Center is doing a remarkable job in tracking the health of those employees whose health and fitness are below par, while maintaining a supportive environment and a good relationship with DCPD personnel.

Legal Counsel Robert Wellington reported to the Committee concerning the prehearing conference for the recent

Application by PG&E to the California Public Utilities Commission (CPUC) which was conducted by Administrative Law Judge Barnett on September 19, 2000. That Application by PG&E, among other matters, addresses the continuation of the DCISC's functions. Mr. Wellington observed that an order by CPUC Commissioner Wood, following the prehearing conference, has effectively tabled the PG&E Application and suspended the procedural schedule relating to continued consideration of PG&E's Application. The matter could, however, be reinstated at any time in which event the Committee should receive timely notice.

Mr. Wellington also reminded the Committee Members that Conflict of Interest Statements, Form 700, under provisions mandated by the California Fair Political Practices Commission, are due annually from each member of the DCISC. He also distributed a revised Committee Roster containing information relative to the Committee's operations. Mr. Wellington also discussed an increase in the number of contacts received from students and other members of the public which are generated by the Committee's presence on the worldwide web and which involve inquiries about nuclear power issues of a general nature. A procedure was discussed and agreed on to generate an appropriate reply to these inquiries.

**VII COMMITTEE FACT-FINDING REPORTS:  
RECEIVE, APPROVE AND AUTHORIZE TRANSMITTAL TO PG&E**

Members discussed with the consultants editorial and substantive revisions to the fact-finding reports awaiting approval and transmittal to PG&E and coordinated the status of items reviewed in those reports with the current Open Items List.

**VIII CORRESPONDENCE**

Copies of correspondence to and from the Independent Safety Committee were included in the agenda packets provided to those present and placed on file in the Public Document Room of the R.E. Kennedy Library at California Polytechnic University at San Luis Obispo.

**IX PUBLIC COMMENTS AND COMMUNICATIONS**

The Chair inquired whether there were any members of the public present who wished to address any remarks to the Committee. There was no response at this time to this inquiry.

**X      ADJOURNMENT**

The February 7, 2001, afternoon meeting of the Diablo Canyon Independent Safety Committee was adjourned by the Chair at 5:15 P.M.

**XI     RECONVENE FOR EVENING MEETING**

The evening meeting of the DCISC was called to order by the Chair at 5:30 P.M.

**XII    INTRODUCTORY COMMENTS**

There were no comments from Members at this time.

**XIII   INFORMATION ITEMS BEFORE THE COMMITTEE**

Mr. Clark requested PG&E Vice President Womack to begin the technical presentations requested by the DCISC for this public meeting. Mr. Womack introduced Mr. Jim Becker to make the first presentation to the Committee.

**Update on Plant Performance,**  
**Plant Events and Operational Status.**

Mr. Becker reviewed operational performance during 2000 for both units and reported that Unit 2(U-2) completed a 9.7 day forced outage and manual shutdown in September 2000, as a result of indications of a failed expansion joint on a steam extraction line from the low pressure turbine. The expansion bellows in the Main Condenser was replaced and a Main Condenser tube leak was also repaired. U-1 conducted its tenth refueling outage (1R10) in October 2000, and the expansion bellows in U-1's Main Condenser were also replaced as a preventative measure. The 1R10 duration was 40.4 days, which was longer than the goal of 26 days, due to a number of equipment issues associated primarily with the Turbine and Generator. The results of 1R10, with reference to radiation exposure, were the best ever for PG&E, achieving 162 person Rem during the outage.

PG&E finalized a negotiated settlement with the State Water Quality Control Board (SWQCB) concerning the effect of DCP's cooling water discharge to the ocean. In response to a question by Mr. Clark, Mr. Becker stated that it was his belief that the agreement between PG&E and the SWQCB would

have little or no effect on DCPD operations, however, it would affect the monitoring of the cooling water discharge.

Mr. Becker reported that in November there was an automatic U-1 reactor trip and an outage of 1.8 days due to an electrical fault in test instrumentation during 1R10 power ascension causing the protection system to actuate. A Licensee Event Report (LER) was submitted to the NRC concerning this event. During 1R10 PG&E completed the work necessary to permit U-1 to operate at a higher electrical output, approximately 24 megawatts higher than in the cycle previously permitted. Nominal electrical output for each unit is now approximately 1155 megawatts. A planned 1.6 day forced outage for U-2 took place on December 9-10, 2000, to repair a hydrogen leak on a weld on the Generator lead box and for planned cleaning of the 2-1 Circulating Water Pump tunnel and removal of bio-fouling from the tunnel. Mr. Becker reported that PG&E actually scheduled this forced outage a few days prior to December 9-10, but postponed commencing the forced outage for one week at the request of the California Independent System Operator (ISO) and PG&E's scheduling coordinator for electricity.

Mr. Becker reported PG&E has now completed the five-year Fire Penetration Barrier Project which involved an extensive inspection program and upgrade to the design and installation of the fire barriers themselves. Modifications were completed to the U-1 Residual Heat Removal (RHR) sump during 1R10 and a similar modification will be accomplished for U-2 during its next scheduled refueling outage. He reported significant progress in developing DCPD's involvement with the STARS cooperative initiative program and he responded to questions from the Committee and confirmed that the STARS' initiatives have been, in general, well received by the DCPD workforce. In concluding his presentation, Mr. Becker observed that a more rigorous, formal and strategic Self-Assessment Program is now in place at DCPD which has more than met management's goal of performing 40 high quality Self-Assessments during 2000.

Vice President Womack introduced Mr. Jim Tomkins, Director of Nuclear Quality Analysis and Licensing at DCPD and asked him to make the next presentation to the Committee.

**Review of NRC Licensee Event Reports,  
Notices of Violations and NRC Issues.**

Mr. Tomkins reviewed and discussed with the Members and

consultants recent Licensee Event Reports (LERs) for DCP. These included:

A voluntary LER for identified seismic inadequacy of non load bearing walls in the Turbine Building, in the vicinity of the Emergency Diesel Generator Rooms was initiated on August 19, 2000, when engineering determined that several walls and some components subsequently attached to the walls as constructed did not meet design criteria applicable to a postulated seismic event involving the nearby Hosgri fault. PG&E determined through an operability evaluation(OE) that, although design criteria were not met, the walls and the wall-supported components would have been capable of performing their safety function during a seismic event. The cause of the LER was determined to be personnel error and inadequate design control. Procedures have been enhanced, the design criteria memoranda (DCM) have been revised, and these walls and their attached components will be upgraded during the next several refueling outages.

When containment temperature indicator (TI-26) failed "as-is" and this condition was not recognized for a six-month period during daily TS surveillance, it was determined that TS 3.6.5.1 was not met and a LER resulted. The cause was a failure to recognize the "as-is" failure mode during design change and surveillance process development. Daily TS surveillance now requires that an operator manipulate the temperature indicator and observe it calculate the Containment average air temperature.

Inspection during 1R10 determined that slightly more than 1% of the Steam Generator(SG) tubes were determined to be defective, 38 tubes out of approximately 3,300 tubes within the SG. The cause was determined to be primary water stress corrosion cracking(PWSCC) and outside diameter stress corrosion cracking (ODSCC) at tube support plate (TSP) intersections. Defective tubes were plugged and PG&E verified that all defective tubes met Regulatory Guideline 1.121 for structural integrity at the end of U-1, Cycle 10.

While performing concurrent tests during 1R10, a first level undervoltage relay actuated which resulted in an unplanned start of Component Cooling Water(CCW) Pump 1-1 and constituted an Engineered Safety Feature(ESF) actuation. Personnel error by the licensed operator and the scheduler, both of whom determined that two tests could be performed simultaneously, was determined to have been the cause. Testing

procedures have been revised to include a prerequisite not to test when an EDG is running. During 1R10 testing and restoration, a first level undervoltage relay failed to reset, resulting in an ESF actuation signal, which shed the only ESF load on the bus, Auxiliary Saltwater (ASW) Pump 1-1 which was feeding the CCW and cooling the spent fuel pool. The cause was found to be the high resistance, due to corrosion, in a test switch pivot point. Corrective actions included repair of the switch and the issuance of a summary alert to operators regarding returning solid state relays to service. There was also a LER initiated for an ESF actuation when two operators opened 230kV switch 211-2, for U-2, instead of 211-1 for U-1. The undervoltage condition on the startup bus resulted in an auto start of all three U-2 EDGs, which did not load as there was still power to the vital buses from the auxiliary transformer. The cause was established as inattention to detail and failure to verify that the intended switch was being actuated. Color-coded signs have been added to the switches for both units and individuals have received coaching on self-verification.

Confirming an observation from the Committee, Mr. Becker stated that PG&E has experienced an increase in errors involving misidentification of unit components located in the same area of the Plant or through misidentification of individual trains and the use of the wrong equipment. He reported that PG&E is employing three techniques to reduce these types of errors: self-verification, tailboards and effective communications. In response to a question, Mr. Becker confirmed that PG&E is also employing post evolution critiques to review lessons learned. Mr. Chuck Belmont of PG&E also commented on efforts at DCPD to reduce errors by operators through self-verification and the use of techniques to assist operators in identifying the proper components of these complex systems.

Mr. Tomkins then reviewed a LER initiated due to excessive flow which was observed from two valves when a temporary leak test of the CCW butterfly valve rubber seat seals was performed. It was found that these valves would have been unable to isolate a leak from the other vital header within 20 minutes, as required by the design basis. Personnel error was the cause, as travel stops were not set correctly and the discs were allowed to overtravel. The travel stops have been checked and adjusted on the CCW valves used to separate headers for both units and maintenance verification tests will be required after each instance of future valve

maintenance.

A LER-type Special Security Event Report was initiated when notification of an Unusual Event was given due to the discovery of a bomb-like device located about 100 yards from the Turbine Building and within protected area for U-1. The suspicious object was identified as resembling an explosive device. The cause of this event was a contractor workgroup culture which tolerated unprofessional behavior. The suspicious object had been in place for several months. A memo has been sent to all DCPD personnel stressing professionalism and the Vice President and Plant Manager have held two meetings with DCPD supervisors to emphasize their oversight role and to stress the supervisors incorporating lessons learned in general employee training and behavioral observation training.

A LER was filed with the NRC when, during 1R10 low power physics testing, U-1 was manually tripped due to control rod problems initiated when rod control was lost due to an instrument failure. The safety function of the rod control function was not impacted by the failure. The cause was the failure of a Westinghouse supervisory buffer memory card, which has been replaced, and the necessary maintenance verification testing has been performed. DCPD will be using new testing methodology provided by Westinghouse to test these cards individually.

A failure to test equipment resulted in a U-1 automatic reactor trip and a LER following 1R10, with the Unit at 46% power operation, when an intermittent electrical short occurred in test equipment. The cause was the poor decision to test other NI channels with NI-41 then in a tripped condition. Procedures have been revised to require a sufficient number of test devices and to eliminate the need to use toggle switches. A memo has been issued to plant personnel warning of the possibility of electrical shorts in digital volt meters and a case study has been provided to appropriate Plant personnel regarding this event and expected test prerequisites.

Mr. Tomkins reviewed the LER trends at DCPD and reported that, as of December 31, 2000: sixteen LERs have been submitted of which ten involved personnel error during equipment return-to-service, design and testing; five LERs involved equipment failures; and one involved inadequate procedures. Corrective actions have included coaching, training and procedure revisions.

No Notices of Violation (NOV) were received from the NRC during 2000, while four Non-Cited Violations (NCVs) have been received during 2000, all of which have been discussed with the Committee during previous public meetings. Mr. Tomkins reported that this represents a 50% reduction in the number of NCVs since 1999. Of the four NCVs, two were for procedural violations resulting in work being performed on the wrong component or unit. Common cause trend analysis performed by NQS did not identify any discernable trends in the cause for the NCVs and all NCVs were entered into the DCPD NCV Tracking/Trending Program. He then compared the NOV and NCVs received by DCPD over the past three years and compared DCPD's performance concerning NOV and NCVs with other plants in NRC Region IV during 2000. DCPD received no NOV which compared to a 0.6 average for Region IV plants. DCPD received seventeen NCVs which compared to an average of eighteen for Region IV plants. In response to a question from Dr. de Planque, Mr. Tomkins and Mr. Belmont reported that PG&E has emphasized the need for an aggressive, significant and successful Corrective Action Program regarding violation of the Equipment Control Guidelines (ECGs) to achieve full implementation of the improved Standard TS.

#### Discussion of the NRC's Performance Indicators.

Mr. Tomkins reviewed the status of the NRC performance indicators (PIs). The indicators produce red, white or green status indications for levels of performance evaluation for the indicators in each category.

Mr. Tomkins reviewed with the Committee the current status and recent actions relative to the PIs. He reported that all DCPD PIs have returned to green status, however, the two trips following 1R10 currently challenge the Unplanned Scrams PI threshold. Both units are at the threshold for Scrams with Loss of Normal Heat Removal PI, and he noted that this PI at DCPD actually entered a white window during part of 2000. He reported that the NRC has now implemented a pilot program concerning Initiating Events and that PG&E has been successful in obtaining tentative approval from the NRC with reference to two Frequently Asked Questions (FAQs) concerning power operations during storm activity and on the Mitigating Systems PI. He then reviewed and discussed with the Members and consultants the PIs and their present values, the threshold and present color status for the PIs for both Units at DCPD and the station thresholds set by PG&E for the PIs



through the fourth quarter of 2000. These were as follows:

Category - Initiating Events

- (1) Unplanned Scrams (automatic and manual) per 7000 critical hours over previous 4 quarters.

Values for U-1 and U-2 are 2.8 and 0.0 respectively and the NRC threshold for each unit is 3. Status - Both Green. Station threshold for each unit is 2.

- (2) Unplanned Scrams Involving Loss of Normal Heat Removal per previous 12 quarters.

Value for both units is 2 and the NRC threshold for each unit is 2. Status - Both Green. Station threshold for each unit is 2.

- (3) Unplanned Transients per 7000 critical hours over previous 4 quarters.

Values for U-1 and U-2 are 0.9 and 1.6 respectively and the NRC threshold for each unit is 6. Status - Both Green. Station threshold for each unit is 3.

Category - Mitigating Systems

- (4) Safety System Unavailability - Emergency Power (average of previous 12 quarters).

Values for U-1 and U-2 are 1.7% and 0.3% respectively and the NRC threshold for each unit is 2.5%. Status - Both Green. Station threshold for each unit is 1.9%.

- (5) Safety System Unavailability - RHR (average of previous 12 quarters).

Values for U-1 and U-2 are 0.3% and 0.4% respectively and the NRC threshold for each unit is 1.5%. Status - Both Green. Station threshold for each unit is 1.1%.

- (6) Safety System Unavailability - AFW (average of previous 12 quarters).

Values for U-1 and U-2 are 0.8% and 0.6% respectively and the NRC threshold for each unit is 2%. Status - Both Green. Station threshold for each unit is 1.5%.

- (7) Safety System Unavailability - High Pressure Safety Injection (HPSI) (average of previous 12 quarters).

Values for U-1 and U-2 are 0.5% and 0.8% respectively and the NRC threshold for each unit is 1.5%. Status - Both Green. Station threshold for each unit is 1.1%

- (8) Safety System Functional Failures (over the previous 4 quarters).

Value for both units is 0 and the NRC threshold for each unit is 5. Status - Both Green. Station threshold for each unit is 2.

#### Category - Barrier Integrity

- (9) Reactor Coolant System (RCS) Specific Activity (maximum monthly values - % of Tech Spec limit).

Values for U-1 and U-2 are 0.1% and 0.9% respectively and the NRC threshold for each unit is 50%. Status - Both Green. Station threshold for each is 1%.

- (10) RCS Leak Rate (maximum monthly values - % of Tech Spec limit).

Values for U-1 and U-2 are 8.0% and 3.3% respectively and the NRC threshold for each unit is 50%. Status - Both Green. Station threshold for each unit is 40%.

#### Category - Emergency Preparedness

- (11) Emergency Response Organization (ERO) Drill/Exercise Performance - percentage of success/opportunities for notifications and PARs during drills, exercises and events of the past 8 quarters.

Value for U-1 and U-2 combined is 92.8% and the NRC threshold is not less than 90%. Status - Green. Station threshold is 95%.

- (12) ERO Participation - percentage of key ERO personnel that have participated in a drill or exercise in the previous 8 quarters.

Value for U-1 and U-2 combined is 91.8% and the NRC

threshold is not less than 80%. Status - Green. Station threshold is 90%.

- (13) Alert and Notification System Reliability - percentage reliability during the previous 4 quarters.

Value for U-1 and U-2 combined is 99.5% and the NRC threshold is not less than 94%. Status - Green. Station threshold is 98%.

Category - Occupational Exposure

- (14) Occupational Exposure Control Effectiveness - the number of T.S. high radiation area occurrences, very high radiation area occurrences, and unintended exposure occurrences in the previous 4 quarters.

Value for U-1 and U-2 combined is 0 and the NRC threshold is 2. Status - Green. Station threshold is 0.

Category - Public Exposure

- (15) RETS/ODCM Radiological Effluent Occurrences - occurrences during the previous 4 quarters.

Value for U-1 and U-2 combined is 0 and the NRC threshold is 1. Status - Green. Station threshold is 0.

Category - Physical Protection

- (16) Protected Area Security Equipment Performance Index - availability of PA IDS/CCTV security systems over previous 4 quarters.

Value for U-1 and U-2 combined is 0.030 and the NRC threshold is 0.080. Status - Green. Station threshold is 134 hrs/mo.

- (17) Personnel Screening Program Performance - prompt reportable events over the previous 4 quarters.

Value for U-1 and U-2 combined is 0 and the NRC threshold is 2. Status - Green. Station threshold is 1.

- (18) Fitness-for-Duty (FFD) Personnel Reliability Program Performance - reportable events over previous 4 quarters.

Value for U-1 and U-2 combined is 0 and the NRC threshold is 2. Status - Green. Station threshold is 1.

Members and consultants discussed performance and aspects of the performance indicators with Mr. Tomkins.

#### **Nuclear Quality Services 2000 Review.**

Mr. Tomkins reviewed and discussed the Quality Performance Assessment Reports (QPARs) issued during 2000.

Identified strengths and positive observations in the QPARs were the increased focus on radiation protection practices, which contributed to the lowest accumulated dose during 1R10 for a U-1 outage, the lowest number of outage personnel contamination incidents ever at DCPD and the lowest numbers of non-surface contamination area personnel contamination incidents for a non outage period at DCPD. Mr. Tomkins observed that the QPARs indicate that the DCPD organization responded well to plant transients, curtailments and shutdowns during 2000, and improvement was noted in the quality and use of Self-Assessments performed. Implementation of the Improved Technical Specifications was judged to have been well-coordinated and peer certification of the Probabilistic Risk Assessment (PRA) Program ranked that program as the best observed among ten similar plants. He stated that conservative decision making, good use of self-assessment and innovation in design were characteristics of noteworthy performance by the Engineering Services organization during 2000. Increased focus and management support of Human Performance as evidenced by formation of a Human Performance Steering Committee and subcommittee in Operations, Maintenance and Engineering were identified as strengths. One licensed operator training class was conducted and all candidates passed their NRC exams.

Mr. Tomkins stated that the 2000 QPARs identified certain areas for improvement including a number of equipment related problems, which highlights a need for a comprehensive program to address age-related degradation of DCPD equipment. Use of Event Trend Records (ETRs) has had limited success in identifying adverse trends although that Program continues to show improvement. There are, however, some organizations which do not use the Program effectively. The QPARs identified less than effective use of the Operator Walkaround/Burden List and an increase in the numbers of Control Board Action Requests (ARs).

In conclusion, and in response to a question from Mr. Clark, Mr. Tomkins stated that the QPARs and the NQS Assessments have identified many of the same issues and, together with Self-Assessments and the NRC PIs, they are used by STATION to produce the Comprehensive Integrated Assessment Report for DCPD.

#### Review of DCISC Selected Performance Indicators.

PG&E Vice President Larry Womack discussed, reviewed with the Members and consultants and responded to questions from them concerning the 22 indicators selected by the DCISC to track DCPD performance. These he summarized as follows (σ indicates an improving trend, τ indicates a declining trend, and υ indicates a steady performance since that indicator was last reported to the Committee):

Ten of the indicators are on or better than the target.

- υ Personnel Contamination Incidents.
- σ Meeting Corrective Maintenance Due Dates
- υ Operating Experience Assessment (OEA) Backlog.
- υ Quality Problem Completion.
- υ Event-Free Days.
- τ U-2 Operating Capacity Factor.
- υ U-1 Primary System Chemistry Index.
- υ U-2 Primary System Chemistry Index.
- υ U-1 Secondary System Chemistry Index.
- υ U-2 Secondary System Chemistry Index.

Three of the indicators are close to meeting expectations:

- υ Radiation Exposure.
- τ Non Outage Corrective Maintenance Backlog.
- τ Unplanned Reportable Releases.

Five of the indicators are not meeting expectations.

- τ Industrial Safety.
- τ Unplanned Automatic Reactor Trips.
- υ Unplanned Safety System Actuations.
- τ U-1 Operating Capacity Factor.
- 1R10 Refueling Outage Duration.

One is a qualitative indicator with no set target.

## System Health Indicator.

One of the indicators is not applicable for this period.

## U-2 Refueling Outage Duration.

Two are confidential indicators reviewed with the DCISC during fact-findings include:

- u Human-Factor Security Events.
- r Vital Area Events.

The Members and consultants discussed the DCISC Performance Indicators with Mr. Womack and it was noted that data used to determine their status includes comparisons to station goals, rather than industry, INPO or NRC regional goals. Mr. Womack confirmed that PG&E presently tracks each of the DCISC Indicators as a part of another tracking process or under a different mandate, and he stated the tracking of the DCISC goals is not, at present, a burden on PG&E. He confirmed that the summaries provided to the Members concerning the Indicators were end-of-year 2000 results.

Committee Members requested that, at the next public meeting of the DCISC, PG&E need only prepare and present the summary results of the DCISC Performance Indicators for their review.

## Activities of PG&E's Nuclear Safety Oversight Committee.

Vice President Womack reported to the Committee concerning the regular joint meeting of the NSOC and the PNAC which was held at DCPD on November 14, 2000. Dr. Rossin and Mr. Booker attended the meeting as the DCISC representatives. Mr. Womack reviewed topics discussed during the meeting, which have all been presented to the DCISC. These include: the System Engineering Program and PG&E managements' expectations of system engineers; the strategies used to address human performance issues; and Radiation Protection(RP)and As Low As Reasonably Achievable(ALARA) Program strategies. Mr. Womack confirmed that the meeting of the NSOC which was scheduled for February 2001, was canceled and an initial meeting of what Mr. Womack described as a subcommittee of the NSOC was held. Mr. Womack discussed PG&E's plans to develop other ad hoc and standing subcommittees of the NSOC and to coordinate efforts with PG&E's partners in the STARS Program to align their offsite committee review functions and he stated that he will

report further to the DCISC during future public meetings as these efforts develop. In closing, Mr. Womack discussed with the Members and consultants the need to retain the independence of the NSOC function in context of the participation by STARS member's personnel.

#### **XIV PUBLIC COMMENTS AND COMMUNICATIONS**

The Chair invited any member of the public present who wished to address any comment or communication to the Committee to do so at this time. There was no response to this invitation.

#### **XV ADJOURN EVENING AFTERNOON MEETING**

The evening meeting of the DCISC was adjourned by the Chair at 7:35 P.M.

#### **XVI RECONVENE FOR MORNING MEETING**

The February 8, 2001, meeting of the Diablo Canyon Independent Safety Committee was called to order by the Chair at 8:00 A.M.

#### **XVII INTRODUCTORY COMMENTS**

Mr. Clark introduced the members and consultants present for this session.

The Committee took up the approval of the November 2000, Fact-Finding Report and, subject to minor editorial corrections, on a motion by Dr. Rossin, seconded by Dr. de Planque, the November 2000 Fact-Finding Report was unanimously approved for transmittal to PG&E.

The Chair recognized Mr. Stan Ketelsen of PG&E's Nuclear Regulatory Services organization to express the appreciation and thanks of the Committee Members and consultants for his help and professionalism during the time he has worked with the DCISC. Mr. Ketelsen will be moving to another assignment within PG&E.

The Chair then requested PG&E Vice President Larry Womack to continue with the technical presentations to the Committee. Mr. Womack introduced Ms. Linda Jolley, Manager of Human

Resource Services at DCPD.

**XVIII INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)**

**2001 Culture Transition Strategies.**

Ms. Jolley began her presentation by discussing the results of the cultural transition effort during 2000, which she described as a progressive effort to continue to enlist employee support in changing DCPD culture and to facilitate safety. She stated that during 2000, the focus of the cultural transition effort had been primarily on the leadership group, the officers and directors, who were later joined by managers. However, currently supervisory personnel are being added to the transition effort through use of a method she described as the cascade approach. All levels of management are now being aligned to support and exhibit leadership behaviors within their work process. She observed that DCPD is managed by process and by what are termed the Centers of Excellence, and that the cultural transformation process at DCPD is designed to foster greater trust, productivity and collaboration among the workforce. Part of this process involves changing the way people think about their daily jobs and requires personnel to hold the leaders accountable for growth and development. She stated her opinion that the leadership group at DCPD was making good progress in achieving these goals, with the leadership team members exemplifying the standards and expectations of leadership in the new culture. She discussed the application of the cultural transformation process to the new competitive power marketplace in California and she acknowledged that some confusion concerning the future still exists within the workforce at DCPD and that the cultural environment appropriate to a competitive market environment is presently in a redefinition process.

Ms. Jolley confirmed that 2001 is the first year that individual contributors, including bargaining unit employees, will be participating in creating a new culture at DCPD. In response to a question from Mr. Clark, Ms. Jolley replied that an important part of PG&E's strategy involves gaining acceptance from the bargaining unit members of the cultural changes being implemented at DCPD. She stated that systems and infrastructures are now in place to support and sustain the new culture and she cited the compensation, positive discipline, and exit interview programs as examples of programs which have evolved and been aligned to support the



cultural transformation process. She discussed some of the systems, measurement techniques and the infrastructure being created to support the transformation effort and human performance fundamentals. **Mr. Clark expressed the interest of the Committee in reviewing the metrics developed for measuring benefits from the cultural transformation effort when those are all established.**

Mr. Womack remarked that the Performance Plans, which the DCISC has reviewed during its past public meetings and fact-finding, are based on the Centers of Excellence which have been created to measure progress in achieving cultural transition at DCP. In response to a question from Dr. Rossin concerning the various levels of supervision and lines of responsibility at the Plant, Ms. Jolley replied that the officers, directors and managers have demonstrated a strong understanding of the new culture and that efforts are being made to fully implement the process with the supervisors. Ms. Jolley acknowledged Dr. Rossin's concern regarding the need for clear reporting responsibilities between the individual contributors and their supervisors. She stated that the connections between individual contributors and their existing supervisors remain strong and defined and that the process of including individual contributors in the cultural transformation process will be further developed over the next year. **Ms. Jolley agreed to provide the DCISC copies of information used internally by PG&E to develop and assess progress concerning the continuing process of cultural transformation and which is used to review and assess the impact of communication with the workforce regarding the supervisory hierarchy at DCP. The DCISC will be kept informed as PG&E makes efforts to incorporate involvement of the individual contributors.** In response to a question from Dr. de Planque, Ms. Jolley described PG&E's efforts to implement the Cultural Transformation Program as about on par with other plants and with other industries implementing similar changes in a regulated environment.

Ms. Jolley then reviewed and discussed each of the strategies being used at DCP in the cultural transformation effort, these include:

- First-Line Supervisor Development - to assess skills and identify and develop those which positively impact the culture, while continuing to define, coach, and modify behaviors to enhance the supervisors' identification with the cultural transformation process.

- Leadership Development - of the officers, process owners and Centers of Excellence leadership through use of workshops, to further develop behaviors through Leadership Team sessions to further the leader's identification with the process and the Centers of Excellence, to support cultural and process initiatives and to leverage new skills to enhance supervisor development, including use and evaluation of information received from feedback and face-time interaction.
- System Alignment - to evaluate existing processes and programs for alignment to support the new culture and incorporate systemic elements to ensure existing systems support human performance fundamentals.
- Employee Communication & Education - to develop and implement individual behaviors and revamp, reenergize and reinforce human performance fundamentals through communication, market and business education, meeting with bargaining unit leadership and employees in informal forums to discuss and review process goals, perceived problems, results and measurements of success.

The Chair thanked Ms. Jolley and observed that the cultural transition efforts at DCPD appear to have been carefully considered by PG&E management. Mr. Clark recognized PG&E Senior Vice President Greg Rueger, who joined the PG&E representatives present for the public meeting.

Mr. Womack then introduced Mr. John Arhar, Engineer in the Steam Generator Group at DCPD for a presentation to the Committee.

#### **Refueling Outage 1R10 Steam Generator Tube Test Results.**

Mr. Arhar began his presentation by briefly reviewing the principal degradation mechanisms affecting DCPD Steam Generators (SGs), these include: outside diameter stress corrosion cracking (ODSCC) and primary water stress corrosion cracking (PWSCC) at the hot legs, at the tube sheets and at dented intersection and non-dented intersection; U-bend PWSCC; anti-vibration bar (AVB) wear scarring; fatigue and cold leg thinning (CLT). During 1R10 a standard inspection of the SGs was performed, which took approximately ten days. The inspection included: inspecting 100% of the full length of the SG tubes with a bobbin; a detailed rotating coil + point probe

inspection of 100% of the U-bend areas and the short radius U-bends in Rows 1 and 2; 100% inspection of the hot leg top of the tubesheet; 100% inspection of the hot leg dented tube support plate (TSP) intersections in critical areas, plus 20% in the buffer zone; and bobbin indications at TSP intersections. During 1R10 there were 43 tubes unplugged and reinspected for return to service under new repair criteria, which, Mr. Arhar stated, was substantially all of the tubes which can be unplugged under the repair criteria presently approved for DCCP. In response to a question from Mr. Clark, Mr. Arhar and Mr. Womack confirmed that the SG inspection efforts during 1R10 took into account the recent failures involving the SGs at the Indian Point-2 nuclear facility.

Mr. Arhar summarized the SG tube repair criteria as it has evolved from the original TS criteria of 40% depth size by bobbin applied to AVB wear and cold leg thinning. The new alternate repair criteria (ARC) provides: per Generic Letter 95-05, concerning voltage-based ARC for axial ODSCC at the TSP; W\* for axial PWSCC in tubesheet and 40% depth sizing by +Point for axial PWSCC at dented TSPs. An ARC to allow >40% axial PWSCC damaged tubes to remain in service is pending NRC review of PG&E's License Amendment Request (LAR). Members discussed with Mr. Arhar and Mr. Womack the heightened level of attention which SG tube failure, as opposed to tube rupture, is receiving from the NRC and the public as a result of the Indian Point experience. In response to a comment by Mr. Clark, Mr. Arhar opined that the ARC does not contribute to an actual increase in the risk of a SG tube leak, as the ARC is confined to support structures during normal operation, however, potential for increased leakage would be likely to exist after an accident which resulted in removal of or damage to the support structure.

Mr. Arhar then reviewed the results of tube degradation identified during 1R10 inspections of SGs 1-1, 1-2, 1-3 and 1-4. A total of 108 tubes were plugged and 43 were unplugged, for a net total of 65 tubes plugged during 1R10. The overall percentage of tubes plugged for the Unit-1 SGs is now 3.9%, with a limit of 15% in each SG and 15% overall. In response to a question, Mr. Arhar stated that PG&E does not expect U-1's SGs to approach the 15% limit before 2005-2006, however, a plugged tube percentage of 10% or greater would begin to have an impact on generation performance for U-1, due to Reactor Coolant System (RCS) flow and change in heat transfer area. SG 1-2 has the highest percentage of plugged tubes at 8.8%. Mr. Arhar reported that during 1R10 there were 852 tubes which did

not require plugging due to application of sizing techniques and the ARC. He discussed and reviewed the history of tube plugging for U-1 since 1R1 and over a period of 12.9 effective full power years of operation. In response to an observation from Consultant Booker, Mr. Arhar confirmed that SG 1-1 and 1-2 were manufactured by a different manufacturer than 1-3 and 1-4, and that this difference explains, to a great extent, the differences in the inspection results.

Mr. Arhar reviewed the lessons learned from the Indian Point-2 U-bend tube failure experience, which was caused by flow slot hour-glassing due to significant denting at the upper TSP causing high stresses in the U-bend apex, leading to axial PWSCC. Early detection was not made during inspections, as the crack signal was masked by noise due to deposits. He stated that PG&E has implemented lessons learned from the Indian Point-2 experience including: establishing data quality guidelines which resulted in a significant number of U-bend retests using higher frequency probes and smaller diameter probes; 23 tubes were preventively plugged due to unacceptable data quality; 4 tubes were plugged due to small circumferential indications near U-bend tangents. One tube with circumferential indications was tested in place to 4000 pounds with no resulting tube leakage.

In concluding this presentation, Mr. Arhar reviewed the next steps PG&E plans to take including obtaining NRC approval for a revised ARC to allow >40% axial PWSCC to remain in service and he stated that PG&E hopes to receive approval for its request to implement this ARC for one cycle during 2R10. In response to a question from Dr. Rossin, Mr. Arhar stated that PG&E has been successful in unplugging tubes using a tungsten inert gas relaxation technique. PG&E will also seek NRC approval of reduced ARC exclusion zone at wedge locations and will request extension of W\* ARC for another two cycles. Chemical cleaning is being proposed during 1R11 and 2R11 to remove scale and reduce the potential for free span ODS CC and sleeving and electro-sleeving options are being investigated for eventual licensing. In conclusion and in response to a question, Mr. Arhar briefly discussed the experience and methodology used with ANO SGs during burst pressure tube testing.

A brief break followed this presentation.

The Chair recognized Senior Vice President Rueger for the next presentation to the Committee.

## Status of California Energy Issue & DCP's Actions.

Mr. Rueger began his remarks to the Committee with the caveat that much of the information he will discuss with the DCISC represents his own opinions concerning the present situation and may not accurately reflect PG&E's opinion or position. He observed that prices for electrical power have escalated rapidly in California since the last public meeting of the DCISC in September 2000. At that time, expectations were that power prices would come down following reduction of the normal summer requirements. He stated that questions have now arisen about when concerns regarding price and supply issues were first raised with the CPUC and Mr. Rueger opined that these are legitimate questions which are now being addressed.

Mr. Rueger stated his observation that, fundamentally, the problems in California and the Western part of the United States are due to the present shortage of available energy, compared to the situation ten years ago when there was a 30% surplus. This shortage resulted from the large growth in load demand which is consuming necessary reserves as the economy in the region expands, coupled with a situation where only about 4% of actual generating capacity was added during the same period. Out of state resources, which traditionally have supplied California's needs during peak demand periods, are presently unavailable as they are required to meet increased demand in their areas. Mr. Rueger opined that the only impact from deregulation which has directly impacted the current shortage, although he acknowledged that in hindsight the deregulation formula was certainly not perfect, was the fact that there has been no investment in the construction of generating facilities during the transition period. This is due, in part, to the protracted period of uncertainty on the part of the utilities and the new market participants on precisely what their new roles will be. He noted that new plants will be entering the marketplace eventually, however, the uncertainties in the market may stop or delay investment and prolong the shortages in California and the West for some time to come. Mr. Rueger observed that the regulatory system in California is not one which makes it easy or fast to create new sources of energy supplies without fully addressing and responding to local concern and opposition to facility location and other issues.

Mr. Rueger discussed the impact of the requirement that

utilities purchase and sell power on the Power Exchange which he described as a spot market for electric power. Utilities are slowly being allowed to purchase on longer-term contracts for what is termed their net open position requirements, i.e., beyond their own generation capacity, however, the utilities are still restricted as to the percentage of their overall requirements which may be purchased on long-term contracts. The result of this short term market activity has been the creation of a situation where virtually 100% of a utility's needs were required to be met in the short term market and at very high prices. DCP's power production, while not sold directly into the market because the transition period for DCP has not yet been terminated by the CPUC, has resulted in the reduction of PG&E's net open position. Mr. Rueger observed that DCP power is now the lowest cost electric power resource available to the State, due to the very bad year experienced in 2000/2001 for the production of hydro power.

The deregulation scheme also created what is termed a "second price auction," which has resulted in the award of contracts based on bids for power generation at the price bid by the last bidder. Mr. Rueger stated that although theoretically this system might function successfully, in a short term market with no price cap one legitimate generator charging a very high price creates the situation where the entire market pays a higher price. Due to a shortage of supply, no comparative market exists and no significant regulatory action has been taken to control the market. Mr. Rueger also observed that the CPUC rate freeze for Southern California Edison and PG&E has meant that the price increases paid for the power supplied could not be passed on to their customers and hence no corresponding reduction in demand due to the high prices has taken place. He summarized the current situation as comprising a broken market with extremely high prices in conjunction with a continuing legal obligation on the part of the utilities to purchase high-cost power to meet their commitments to their customer at a flat rate of return. He stated that one of the few realistic alternatives to escape the situation for the utilities is to consider defaulting on payments owed and to seek protection from creditors in bankruptcy. In response to an observation by Dr. Rossin, Mr. Rueger commented that when San Diego Gas & Electric Company's customers received large increases in their electric bills, the Legislature's imposition of a rate cap resulted in energy usage, which initially dropped around 11% after customers' bills increased, returning very quickly to its pre-increase

levels. Mr. Rueger opined that, over time, one of the impacts will be that the high prices paid by the utilities for power used by their customers will be passed on to consumers at all levels.

Mr. Rueger stated that the energy picture has been as much driven by supply considerations, due to a very dry year for hydro production in California and the driest year on record for the Northwest, as financial over the past winter. PG&E has the largest investor-owned hydro power production system in the United States. Normally, winter is not a time when supply problems are encountered, however, he remarked that there have been three Stage-3 Emergencies in the last 26 days and at least two days when rolling blackouts were experienced. Mr. Rueger commented on the constraints imposed on electric power transmission which exist within California and which limit PG&E's ability to transport power from Southern to Northern California, and which has caused Northern California to bear the brunt of rolling blackouts. In response to a question from Dr. Rossin, Mr. Rueger noted that to date it has not been economically feasible to build a new parallel line to increase transmission capabilities, however, the high cost power has made the \$300 million necessary for the construction of such a line feasible and PG&E has been given authorization from the ISO to augment the transmission grid by constructing additional lines. Mr. Rueger observed that, because prices stayed extremely high through this winter, the financial situation for PG&E and Southern California Edison has deteriorated rapidly and their suppliers have expressed concern about receiving payment. With the extremely high cost of power purchased on the Power Exchange during the November-December 2000 period, PG&E has found itself unable to pay for that power. He noted that in January 2001, a number of independent power generators were not producing power due to what he termed a virus of condenser tube leaks, which may have masked the reality that these independents feared they would not receive payment for any power they sold into the market. In response to this situation the California Department of Water & Power Resources began to purchase power on behalf of the utilities, and he noted that in a matter of days approximately 4,000 additional megawatts became available.

Mr. Rueger remarked that, unlike electricity, PG&E is able to pass on increases in prices it pays for gas to its customers. However, the financial transactions necessary to purchase that gas have been structured so that the PG&E must

have the capability to borrow funds for a period of time. With the current uncertainties and the financial situation impacting PG&E's credit rating, gas suppliers are demanding payment prior to delivering gas and PG&E has been challenged to keep the supplies of gas available. He remarked that any disruption or diversion of gas supplies from PG&E's core residential customers would be a huge problem, due to the resulting need to enter every residence to restore service. However, disrupting gas supplies from PG&E's non-core customers operating gas-fired electric power generators would have a severe negative impact on the supply of electric power. The U.S. Department of Energy issued a mandatory order requiring domestic gas suppliers to continue deliveries, and Mr. Rueger remarked that Canadian sources, which supply about one half of PG&E's gas needs, have never stopped their deliveries. PG&E has negotiated terms with gas suppliers which would give the suppliers an advantageous position in a possible bankruptcy, and the order by the Department of Energy is not expected to be extended. Mr. Rueger, in response to a question from Dr. Rossin, discussed efforts to mitigate the effects of the second price auction and attempts which have taken place to manipulate power requirements and bidding prices on the Power Exchange. He remarked that, because the market has had no consistent cap, a situation was allowed to exist wherein out-of-state brokers were able to control power allocations and were actually able to purchase PG&E generated power at \$250 a megawatt hour and then sell that same power back into the market the next day for \$1,400 a megawatt hour.

In response to this situation, the Federal Energy Regulatory Commission instituted what is termed a "soft price cap." However, the soft price cap considers opportunity as a justification for price which largely negates the soft cap's effect. He further noted that the computers used by the Power Exchange and the ISO have proven to be inadequate to implement the soft price cap. The Power Exchange has now been essentially replaced by the ISO in the deregulation scheme, as California is now purchasing its power requirements on the market. In response to a question from Consultant Booker, Mr. Rueger replied that, although PG&E's natural gas system is configured to provide for storage during the summer months, many independent generators have opted to use their stored reserves during the summer because of the high gas prices. These independent generators must now purchase gas on the spot market. Mr. Rueger remarked that the capacity of the PG&E's reserves to serve new sources of gas-fired electrical generation, provide supplies to meet normal requirements and



to maintain normal reserves during the summer months may be challenged. However, at present PG&E believes the system will be able to cope with these problems, and he again directed the Committee's attention to the interrelated nature of the issues.

Mr. Rueger observed that February 1, 2001, was the first instance when PG&E actually defaulted on a payment due for energy. PG&E is committed to maintaining a working cash reserve, sufficient to continue the vital public service provided by the Utility's activities. He reported that payment in full to electric energy suppliers and principal payments on loan obligations have necessarily been suspended due to PG&E's cash flow situation and to keep its other utility-related functions operating. Dividend payments to shareholders have also been stopped. He observed that PG&E is attempting to avoid being forced into bankruptcy and remains cautiously hopeful that the State can act in time to avoid that situation. Mr. Rueger expressed his view that the State should: 1) act to stabilize the situation and keep the energy supply viable by purchasing its long-term power requirements and address the situation created by the current rates, which do not pass the cost of the power provided to the consumer; 2) address the debt incurred by the utilities; and 3) bring power from new sources into the State, create new generation resources within the State and implement immediate and effective energy conservation measures.

In discussing DCP's actions in response to the California energy issue, Mr. Rueger confirmed that the situation in the State has impacted DCP, however, PG&E has been working to minimize any impact on operational considerations. He observed that because of the challenges faced by California, DCP has been recognized as an important, crucial and reliable contributor to meeting the State's energy requirements. Mr. Rueger remarked that there have been few instances when PG&E recognized any attempt to pressure or influence DCP operational decisions in response to the State's energy situation. He stated that the NRC has been supportive of PG&E and DCP management in resisting such situations. He also provided some examples of instances when PG&E has responded to the State's immediate need, and safely modified, postponed or curtailed certain operational activities in order to continue to operate within acceptable safety parameters as determined by PG&E and the NRC.

Mr. Rueger also acknowledged that the California energy

situation has received the attention of DCPD employees and he noted that PG&E is working to communicate with the employees through daily meetings with the leadership teams, directors and managers concerning current information on the energy situation. Efforts have also continued to communicate with all DCPD employees during All Hands Meetings and by holding informal brown bag lunch assemblies to provide information and respond to questions from employees. Dr. de Planque commented on an article by Mr. Rueger in a newsletter and expressed her opinion that it was very well done and noted that his emphasis on safety was clear and direct. Mr. Rueger remarked that PG&E continues to monitor the early warning indicators for employee distraction and he observed that personnel error rates have actually improved over the recent period. In response to a question from Mr. Clark, Mr. Rueger replied that, as the NRC has ultimate jurisdiction for DCPD operations, there is no person in California who could issue an emergency order to PG&E to operate the Plant. Dr. de Planque remarked on the challenge which DCPD may face due to requirements for off site power availability and Mr. Rueger confirmed that PG&E has held discussions with the NRC on this subject and has previously made equipment changes to increase voltage support.

Mr. Rueger observed that DCPD's emergency siren system would be minimally affected by the rolling blackouts. In response to a question from DCISC Consultant Booker, Mr. Rueger confirmed that the PG&E's financial situation has had some impact on estimated budget expenditures at DCPD, although he remarked that very few of the budget reductions which would affect power generation activities because those activities are considered crucial functions. He observed that there will be no impact due to financial condition on upcoming outage activities for either unit. Minor projects which have been deferred at DCPD for the first months of 2001, due to the financial situation of the Utility, total only about \$2-\$2.5 million. Impact will be directly felt with regard to deferment of employee merit salary increases and financial bonus for DCPD performance. PG&E has communicated to its employees that such payments must be suspended until sufficient cash reserves are again available. A small number of contractors have been released at DCPD. Mr. Clark encouraged Mr. Rueger and PG&E to be alert for employees who might tend to make non-conservative decisions, based upon the California energy situation and PG&E's current financial difficulties, and Mr. Rueger confirmed that PG&E was cognizant of the possibility and he observed DCPD management has purposely assumed a "business as usual" posture concerning

regularly scheduled activities, including an upcoming inspection of DCPD by INPO, and is continuing to emphasize that no sacrifices in safety are acceptable at any time. He remarked that much of the publicity concerning DCPD's operation and its importance in meeting California's energy needs has been very positive, and has even included positive feedback from groups fundamentally opposed to nuclear power and that employees are aware that the State is very cognizant of the important part Diablo plays in meeting its needs for energy.

Mr. Clark remarked that the Committee would appreciate being kept up to date with regard to plans by PG&E which would impact DCPD operations, resources or staffing. Dr. de Planque offered, on behalf of the Committee, to foster communication between PG&E and any or all of the Committee Members' appointing entities. Mr. Clark noted that PG&E's actions at DCPD in response to the California energy situation appear to be appropriate to the situation and that management has taken effective action in communicating concerning the situation with employees. The DCISC will continue to monitor the situation, however, at the present time the Committee has not identified any new concern about the continued safe operation of DCPD due to the current California energy situation.

Mr. Rueger requested Mr. Bob Hite to make the next presentation to the Committee.

**Refueling Outage 1R10 - "As Low As Reasonably Achievable" (ALARA) and Dose Results.**

Mr. Hite stated that the official exposure for 1R10 was 162.5 Rem which made 1R10 the lowest dose outage in U-1's operational history. U-1 outages have generally seen a radiation dosage in the range 300 Rem for a typical outage. The duration of 1R10 was 40 days 10 hours and there were 77 personnel contamination incidents (PCI) for exposure of both clothing and skin, which Mr. Hite observed was a good performance. He then briefly reviewed other statistics relating to the dose results for 1R10. The exposure estimate for 1R10 was 168 Rem and the goal for the outage was 147.5 Rem. Emergent work contributed 12.9 Rem and the extended duration of the outage added 1 Rem for a total additional exposure of 13.9 Rem.

Mr. Hite reviewed and discussed with the DCISC 1R10 radiation work permits and the estimated-to-actual exposure as

follows:

<u>Radiation Work Permit</u>	<u>Estimated Exposure</u>	<u>Actual Exposure</u>
Primary SG Eddy Current Work	25.0 Rem	23.9 Rem
Primary SG Nozzle Dams	7.9 Rem	8.9 Rem
Scaffolding in Containment	4.7 Rem	7.2 Rem
SG Secondary Side Inspection	5.8 Rem	7.2 Rem
Reactor Reassembly	7.8 Rem	6.0 Rem

Mr. Hite discussed the exposure experienced during 1R9 which resulted in a higher dose rate than planned and a higher exposure than expected. He stated that there was a concentrated and successful effort to make sure that the 1R10 forced O2 crud burst dose rate, which activity contributed to the higher dosage experienced for U-1 during 1R9, was explicitly planned for 1R10 and scheduled to reduce the 1R9 experience. He discussed the effect of zinc injection on the dose rates in the high-dose areas and described the dose reduction rate and the consequent benefits during 1R10. Dr. de Planque expressed her observation, and Mr. Hite agreed, that the nuclear industry should look at dose distribution equally with collective dose when examining the impact of managing dose rates and **she suggested the DCISC may want to schedule an examination of dose distribution results during a future fact-finding.** Mr. Hite opined that the largest contributor to collective exposure reduction is good scheduling, planning and implementation of work control processes. He remarked that there has also been a concerted effort over the last two refueling outages to employ state of the art filtration techniques to reduce crud source term in the primary coolant, which directly reduces available contamination.

Mr. Hite confirmed that DCPD is considering utilizing more remote monitoring techniques and technology to further reduce personnel exposure during future outages. He remarked that U-1 experienced fairly significant reductions in SG inside bowl dose rate averages since 1R7 and the experience of 1R10 at 10.1 Rem/Hr is actually less than the experience of 10.3 Rem/Hr during U-1's first refueling outage. He described this as the results of forced oxygenation and the crud burst and subsequent cleanup work for the ALARA Program. He observed that extending an outage results in an overall collective dose increase and short duration, efficient outages contribute to lower dosages. He then reviewed the DCPD annual radiation exposure and the three-year rolling average used by

the NRC to grade performance. Members discussed with Mr. Hite the INPO goals and comparison of performance data. In response to a question from Mr. Clark, Mr. Hite stated that at present, with the available data, the contribution of zinc is not demonstrable because of a present lack of sufficient isotopic gamma scans of the piping surfaces to determine the relative ratios of Cobalt 58 and 60 and Zinc 65. However, he stated that it has been his professional experience with boiling water reactors that zinc assists in reducing dose rate and collective dose results.

In response to a question from Dr. de Planque concerning the availability of RP technicians, Mr. Rueger and Mr. Hite replied that DCPD and other plants are continuing to work together and with their contractors to ensure qualified personnel are available for refueling outages. In response to a question from Consultant Booker, Mr. Hite remarked that the exposure goal for 2R10 is expected to be around 109 Rem.

#### **XIX PUBLIC COMMENTS AND COMMUNICATIONS**

The Chair invited any member of the public present who wished to address any comment or communication to the Committee to do so at this time. There was no response to this invitation.

#### **XX ADJOURN MORNING SESSION**

The morning meeting of the Diablo Canyon Independent Safety Committee was adjourned by the Chair at 11:55 P.M.

#### **XXI RECONVENE FOR AFTERNOON MEETING**

The afternoon session of the DCISC was called to order by Mr. Philip Clark, Chair of the Committee at 1:30 P.M.

#### **XXII INTRODUCTORY COMMENTS BY COMMITTEE MEMBERS**

The Chair noted that DCISC Member Dr. de Planque was present, Dr. Rossin having left the meeting earlier, and that a quorum of the Committee was present to continue the public meeting and requested Vice President Womack to present the final technical presentations scheduled for this public meeting of the DCISC.

#### **XXIII INFORMATION ITEMS BEFORE THE COMMITTEE (Cont'd.)**

PG&E Vice President Womack introduced DCPD Outage Manager Mr. Brad Hinds to make the next two technical presentations to the Committee.

### Refueling Outage 1R10 Overall Results.

Mr. Hinds stated that 1R10 was his first outage experience as Outage Manager for DCPD, having been at the Plant since 1994 and having served previously in Operations as a shift technical advisor and as DCPD Manager of Scheduling and Project Management.

Mr. Hinds observed that 1R10 was a very good outage as regards nuclear safety. There were four personnel injuries during 1R10 which equaled the best performance for a refueling outage. Senior Vice President Rueger noted that PG&E is focused on developing and communicating fundamentals of a safety program at DCPD which is based upon everyday behavior and which encourages involvement from employees to remain vigilant against unsafe work habits of their fellow employees. Mr. Hinds stated that there were three significant human performance events during 1R10 on which the Committee has received prior presentations by PG&E and Mr. Hinds observed that none of these events challenged nuclear safety.

The baseline schedule for 1R10 was 26 days and the actual schedule was 40 days. Significant factors contributing to the delay were: six days delay attributable to Main Generator Phase C repair; three days attributable to Phase B repairs; three days attributable to M-48 testing and leak repair; and 1 day delay due to voltage regulator repair. All these delays were for items which were emergent in nature and were unrelated to work activities planned for the outage. Mr. Hinds discussed these items, the repairs effected, and the rationale and future plans for generator testing by which they were identified. Mr. Hinds observed that work which was planned was well scheduled and that absent the need to make repairs to the Main Generator the outage might have been accomplished within the scheduled 29-day duration.

Mr. Hinds reviewed the major routine scope of the items which were accomplished during 1R10. These included:

- Refueling the Reactor.
- Critical valve maintenance.
- Steam Generator maintenance and inspections.
- Turbine Generator maintenance and inspection.

- Diesel Generator maintenance.
- Vital Bus H maintenance.
- Surveillance testing.

He then reviewed and discussed the activities which constituted projects of major scope for the 1R10 outage, and he noted that no items of major scope were deferred during the outage. The items accomplished included:

- Containment Recirculating Sump Screen replacement.
- Reactor Coolant Pump cable replacement
- Main Feedwater Pump speed control replacement.
- Unit up-rated by 23 Mwe.

Mr. Hinds identified and discussed certain experiences during 1R10 which have been identified as areas of possible improvement for future outages. These include routine comprehensive preoutage planning and preparation, adherence and coordination of the outage schedule, and cost forecasting and control. In responding to a question, posed during an earlier presentation, concerning why one SG had significantly higher dose accumulation than the other, Mr. Hinds observed that the Reactor Coolant Pump for that particular SG was secured earlier during the shutdown sequence, raising the bowl dose rates. In response to a question from Mr. Clark concerning outage goals and incentives, Mr. Hinds remarked that the goals set for 1R10 were challenging to the organization but were achievable and Mr. Rueger remarked that the schedule duration represented the largest unachieved goal and that outage cost goal was essentially met.

#### **Refueling Outage 2R10 and Safety Plan.**

Mr. Hinds reviewed and discussed with the Committee the major maintenance scope of the upcoming tenth refueling outage for U-2, these include:

- Refueling and fuel repair.
- Steam Generator maintenance.
- Main Turbine Generator maintenance
- 4kV and 480V Bus H maintenance.
- Valve maintenance.
- Surveillance testing.

Mr. Hinds reported that chemistry indications of fuel

damage have been found for U-2 which may involve one open rod on one fuel assembly and that consequently, PG&E will be doing "in mast" sipping of the fuel assemblies removed to locate any fuel damage and will have contingency plans in place to deal with any damaged fuel discovered once it is in the spent fuel pool. Mr. Hinds then discussed with the DCISC the scope and the reasons for the major projects identified to date for 2R10, these include:

- Main feedwater piping replacement.
- Containment Recirculating Sump Screen modification.
- Reactor Coolant Pump motor cable replacement.
- Main Generator current transformer dismounting.
- Reactor Vessel Refueling Level Indication System upgrade.
- Reactor Coolant System Vacuum Refill System.

Personnel goals for 2R10 include achieving an exposure goal of 109 person Rem with no personnel safety incidents, errors or disabling or reportable injuries. Nuclear safety goals include no loss of core cooling with the core in any location, event-free mid-loop operations and no equipment damage. The budget for outage duration and cost for 2R10 is for a 35-day outage at a direct cost of \$31 million, the goal is for a 30-day outage at a direct cost of \$30 million and the plan is to achieve the outage in 26-27 days at a direct cost of no more than \$28 million. Mr. Hinds reviewed the schedule for 2R10 major milestones in outage preplanning including work order preparation, issuance of the Rev 0 Schedule, completion and issuance of work instructions for the outage which is scheduled to commence April 29, 2001. Mr. Hinds observed that the Outage Safety Plan will be very similar to that for 1R10 and that there have been no unusual activities or risks identified and that overall risk is about the same as recent DCPD outages. He identified the higher risk evolutions as the two mid-loop operations, before core offload and following core reload. **Mr. Clark suggested that the Committee may wish to review any differences between DCPD outage risk and that of other Region IV plants, or whether the differences might be attributable to PRA modeling.**

In concluding this presentation, Mr. Hinds discussed the focus areas for improvement during 2R10 including expanded use of pre-outage milestones, top priority for safety and quality and attention to human performance fundamentals through use of tailboard briefings, self-verification and use of three-way communications. Mr. Clark observed that the Audit Report on



1R10 identified post evaluation critiques as an area for possible improvement and Mr. Hinds confirmed that PG&E is working to improve the Lessons Learned Program to encourage personnel to make immediate comment and offer suggestions to the Program in a timely fashion so they may be evaluated and if appropriate incorporated and implemented during the next refueling outage.

In response to questions from Consultant Wardell, Mr. Hinds confirmed that there were no significant errors involving clearance coordination during 1R10, that Emergency Core Cooling System(ECCS) voiding was not a problem during 1R10 due to enhanced void venting procedures for the ECCS, and that baffle jetting was not a problem during 1R10. Mr. Hinds remarked that because evidence of baffle jetting was found during 2R9, fuel assemblies will be clipped in the spent fuel pool during 2R10 prior to core reload as a precaution to prevent baffle jetting during the next U-2 operating cycle. Vice President Womack commented on the difference in design of reactor internals between U-1 and U-2 and he stated that it is PG&E's belief that U-2's design, with a partially bolted baffle and the direction of cooling flow between the core barrel and baffle, represents the principal cause for the onset of baffle jetting for U-2 during its last two cycles.

Mr. Clark called upon Senior Vice President Rueger to make the final presentation to the Committee for this meeting.

#### **Five-Year Nuclear Power Generation Business Plan.**

Mr. Rueger stated that PG&E's Five-Year Business Plan is a strategic performance plan which identifies key focus areas and that the Plan is updated annually. He reviewed with the Committee some of the major initiatives, past and future, which have or are expected to impact DCPD operations. Mr. Rueger reviewed PG&E's efforts to bring DCPD operating costs down to permit the plant to operate effectively in the competitive electric power market in California. He remarked that PG&E identified a gap of approximately \$200 million, which had to be made up from either increased revenue or reduced generation costs for DCPD power. The Cost Management Plan, Performance Plans and the Re-Engineering Program, concerning which the DCISC has received information during past public presentations, were integral parts of efforts to reduce the gap and Mr. Rueger observed that these efforts were largely successful in reducing the gap and that, given the present state of the market for electric power in California,

there is no question that DCPD is a very competitive generating resource. At the present time, DCPD-produced power is the lowest-cost available within California.

Mr. Rueger identified and discussed with the Committee four separate strategies to facilitate the transition of DCPD to the new market environment. These include: the STARS alliance formed with four other nuclear plants with very similar designs to DCPD, and Mr. Rueger opined that a joint nuclear operating company may eventually emerge from the STARS alliance; continuing the Process Focus for addressing reengineering and cultural change efforts in terms of budget, costs, goals and organizing personnel to break down functional barriers; continuing encouragement and development of cultural change within the DCPD organization; and market development and creation of a strong market alliance for bidding DCPD power into the competitive market as that market evolves. Mr. Rueger observed that PG&E has been preparing DCPD for entry into the market and he briefly reviewed some of the efforts made. He stated that PG&E is now at a point where DCPD must continue to demonstrate profitability and sustained good performance at lower cost to secure its current value, and he identified and discussed some of the challenges DCPD will face in extending its value through the current license periods of 2021 and 2025 respectively for both units. PG&E has chosen not to address the issue of license extension for either unit, or major asset replacement for DCPD, until around 2005 and may do so in concert with some or all of its STARS partners. In response to a question from Mr. Clark concerning the reactor pressure vessel, Mr. Rueger confirmed PG&E received construction period recapture on its license term from the NRC and that both reactor vessels are being preliminarily evaluated for license extension. U-2 appears to have no major issues in this regard, while U-1 may require some modification prior to receipt of a license extension.

Mr. Rueger reviewed and discussed the DCPD Performance Plan through 2004 and beyond, which defines PG&E's overall goals for the DCPD organization into safety, industry leadership, generation performance, financial performance, human performance categories. Mr. Rueger remarked that, for every overall goal established by the Performance Plan, there is a corresponding plan to functionally link that overall goal with a practical plan for actually achieving the goal within the organization, and he confirmed that those implementation plans are organized by process or by Centers of Excellence concepts. **Mr. Clark requested PG&E provide a current set of**

the overall Performance Plan documents, together with the supporting plans to implement the strategies, to the Committee when they are available and that the Committee may wish to schedule a fact-finding to further review the Performance Plan. Mr. Rueger and Mr. Clark briefly discussed PG&E's current requirement to keep certain information concerning generation cost as proprietary due to the present competitive environment for power generation.

In response to a question from Dr. de Planque, Mr. Rueger confirmed that PG&E intends to work with its STARS partners to meet long-term staffing requirements for the DCPD organization and strategies are in place to secure, train and develop and maintain a workforce with the necessary skills required to continue operating DCPD.

The Chair then expressed the Committee's thanks and appreciation to PG&E and Mr. Rueger for the excellent quality of the technical presentations made to the DCISC during this public meeting. A short break followed.

#### **XXIV PUBLIC COMMENTS AND COMMUNICATION**

The Chair recognized Mr. John Gagliardini of Arroyo Grande, California, to address some remarks to the Committee.

Mr. Gagliardini expressed his opinion that PG&E should receive contracts for further research and development efforts concerning nuclear power. He stated that he had reviewed information on other PG&E projects in the local area including the Gunneson Land Project 18P013, and he expressed his opinion that it was not PG&E's fault that these projects did not ultimately result in additional electric power generation. There were no questions or comments and the Chair then thanked Mr. Gagliardini for his comment.

Mr. Les Goldfisher was then recognized to address remarks to the DCISC.

Mr. Goldfisher stated that he was present as a concerned citizen and that he wished to direct the Committee's attention to a lecture being held that evening, at California Polytechnic University in San Luis Obispo, by Professor Ernest J. Sternglass concerning the health effects of nuclear fallout and releases from the operation of nuclear power plants. Mr. Goldfisher read a press release concerning the subject matter of Professor Sternglass' lecture, which includes a discussion

concerning the level of Strontium-90 found in the teeth of children residing in the vicinity of U.S. nuclear facilities and data regarding cancer and infant mortality rates. Mr. Clark thanked Mr. Goldfisher and noted that he believes that all the Committee Members have been long aware of Professor Sternglass' views. Dr. de Planque commented that she has been aware of Professor Sternglass' studies for 30 years and that it is her recollection that Professor Sternglass' studies were considered by the Health Physics Society during the 1970's and that the Society's position at that time was that the evidence was not sufficient to sustain Professor Sternglass' conclusions concerning the effects of radiation. Dr. de Planque observed that the data she has reviewed, as a part of her professional field, indicate that health effects below certain levels, and certainly at low-level environmental levels, are not evident at all in epidemiological studies or any other human studies. Dr. de Planque noted that she is not familiar with Professor Sternglass' current data regarding children's teeth and could not comment on it, however, she noted that there are many reasons why radioactivity in teeth might be observed. She remarked that it was her opinion that Professor Sternglass' claims, based upon the data he has presented, have not been substantiated by significant numbers of scientists working in the field, both in this country and abroad. Mr. Clark noted that there is an extensive radioactivity monitoring program of the local area around DCP, reviewed regularly by the NRC, which has consistently shown the radiation levels around the Plant are undistinguishable from natural background levels existing in nature and that studies have consistently shown that the impact of the operation of nuclear power plants on radiation level is low and does not present a health issue. Mr. Clark noted that Mr. Goldfisher has attended past meetings of the Committee and participated in the public tour of DCP held this date. He remarked that the DCISC's role does not include supporting or opposing nuclear power and that the nuclear industry is doing many things to disseminate facts concerning nuclear operational issues. Legal Counsel Wellington noted that he had previously provided a copy of the press release concerning Professor Sternglass' lecture to the Committee Members and consultants.

## **XXV      CONCLUDING REMARKS AND DISCUSSION**

Mr. Wellington reviewed with the Members the present status of the Committee finances and he noted that all outstanding balances or amounts carried over from past year's

grants of funding from PG&E have been resolved. Mr. Wellington noted that PG&E will shortly receive a full refund of the grant balance remaining unspent from the funds provided for the Committee's operations during 2000. Mr. Clark remarked that it was his observation that during 2000, the Committee operated within its budget and he commented that, if possible, funds should be reserved through the end of any calendar year to address any unforeseen contingencies affecting DCPP operations.

The Chair directed that Consultant Booker obtain Dr. Rossin's comments on the December 13 and 14, 1999, fact-finding reports and incorporate those comments, if any, into the final reports. Final versions of the reports will then be sent to the Members for their review and, upon their verbal approval, the December 13 and 14, 1999 fact-finding reports were authorized for transmittal to PG&E.

Future public meetings of the Committee are scheduled for June 20-21 and October 17-18, 2001, and a public meeting of the Committee was tentatively scheduled for January 29-30, 2002, by the two Members present.

#### **XXVI      ADJOURNMENT OF THE THIRTY-SECOND PUBLIC MEETING**

There being no further business, the Chair adjourned the thirty-second public meeting of the Diablo Canyon Independent Safety Committee at 3:36 P.M.